FOOD TECHNOLOGY

ABSTRACTS

CENTRAL FOOD TECHNOLOGICAL
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\+ Indian journal

1. GENERAL

1.3 Energy subsidy as a criterion in food policy planning, MALCOLM SLESSER, J. Sci. Fd Agric., 1973, 24(10),1193.

Food production, both agricultural and industrial are assessed in energy terms for 137 food producing systems and a methodology is revealed which is useful in long range planning for food production, especially in developing countries.

KAR

1.4 Food Group Symposium, March 1973, J. Sci. Fd Agric., 1973, 24(8), 981-989.

The abstracts of the following papers presented at a symposium of the Food Group held at University of Reading on the 21st March 1973 are given.

1. Lipids of leaf protein concentrates. Effect of crop maturity and product storage by I.G.Karis and B.J.F.Hudson.

2. An examination of lipid from textured vegetable protein by C.E.M.Ferber.

3. Lipids in wheat flour doughs by D.L.Mann and W.R.Morrison.

4. A study of the distribution of proteins in cakes and their batters by Neil R.Passomore.

5. The microstructure of dough and bread using histophysical techniques by M.A.Standing.

6. Factors affecting baking properties of wheat cassava composite flours by A.O.Ogunsua and B.J.F.Hudson.

7. The effect of starch on the determination of protein by dye binding by G.P.Jones and A.L.Lakin.

8. The fat globule membrane of ice cream by A.E.Bird and G.Stainsby.

9. Bitterness in a papain digest of casein by C.L.Lin.

10. Amino acids and nucleotides from yeast by T.M.C.Davies.

1.5 Impact of environmental controls on the food industry, W.A.Mercer, Fd Technol. Champaign, 1973, 27(10), 60.

The proposed EPA pollution control regulations are feared to throw the medium sized food canning and freezing units out of business. A plea has been made to allow flexibility in the proposed effluent limitations.

JVS

1.6 The food regulatory agencies and industrial quality control, V.O.Wodica, Fd Technol. Champaign, 1973, 27(10), 52.

Details of FDA activities.

1.7 The new regulatory system in Federal Water Quality Law, M. Stein, Fd Technol. Champaign, 1973, 27(10), 6.

Discuss the goals compliance dates, performance standards, enforcement and penalties specified by Federal Water Pollution Act as amended in 1972.

JVS

1.8 The Federal Water Pollution Control Act (FWPCA) Amendments of 1972 - implications for food producers and processors, W.A.Bough, Fd Technol. Champaign, 1973, 27(10), 74.

The clarification of FWPCA in the form of questions and answers.

JVS

2. CEREALS

2.47 Thermoanalytical study of moisture in grain, M.B.NEHER, R.W.PHEIL and C.A.WATSON, Cereal Chem., 1973, 50(5),617.

Water is absorbed and released reversibly as free water if the temperature does not exceed 200°C. Soybean has about 5% weight of moisture and therefore, is different from other grains like corn, wheat, oats or sorghum. Pyrolysis and/or oxidation predominates above 200°C. Close agreement has been observed between TGA weight losses below 200°C and DTA endotherms.

BSN

2.48 Collaborative study of the quantitative determination and chemical confirmation of sterigmatocystin in grains, M.L.STACK and J.V.RODRICKS, J. Ass. off.anal. Chem., 1973, 56(5), 1123.

The test method consisted in extraction with acetone-water (9+1), partition of the first extract into hexane, and then into chloroform followed by TLC. The fluorescence intensity on TLC of sterigmatocystin was compared with that of a standard. Corn and oat samples posed some difficulty in analysis due to the interference of an oily residue with sterigmatocystin on TLC plates.

JVS

**+2.49 Effect of differential maturity of paddy grains in a panicle on their milling quality, H.S.R.DESIKACHAR, M.K.BHASHYAM, K.A.RAMANATH and M.MAHADEVAPPA, J.Sci.Fd Agric., 1973, 24(8), 893.

Branches of paddy panicles were divided into 4 equal parts and grains collected from each part separately. Moisture content at harvest and milling breakage after shade drying of grains to 12 to 13% moisture were determined. Average moisture content of grains gradually increased while milling quality generally suffered in grains from the top first quarter to the last quarter at the bottom. The same trend was found when the grains in the "top" quarter were compared with those from the 'rest' of the panicle. The proportion of sun checked grains was highest in the 'top' fractions at all stages of maturity. The grains at the 'top' also had a tendency to shed easily from the panicle. At early stages of maturity milling breakage of grains in lower portions of panicles was high perhaps due to immaturity and softness.

AA

**+2.50 Factors affecting the puffing quality of paddy, T.SRINIVAS and H.S.R.DESIKACHAR, J. Sci. Fd Agric., 1973, 24(8), 883.

Histological studies showed that in good puffing varieties of paddy the aleurone layer was thin and weak at the specific points of bursting while the clearance between the husk and the kernel was large and the grain was easily shelled. In the poor puffing varieties the aleurone was uniformly thicker along the peripheral section while clearance between husk and grain was smaller and the grains were relatively more difficult to shell. Optimum maturity of grains at an average grain moisture of 20 to 24% was essential for getting maximum puffing. Delayed harvesting caused sun checks and reduced overall puffing expansion. Sun checks caused by severe drying in the sun produced a similar effect high grain density was associated with better puffing.

AA

2.51 A gel consistency test for eating quality of rice, G.B.CAGAMPANG, C.M.PEREZ and B.O.JULIANO, J. Sci. Fd Agric., 1973, 24(12), 1589.

A rapid simple test, complementary to the test for amylose content, was developed based on the consistency of a cold 4.4% milled rice paste in 0.20 N-KOH. Consistency is measured by the length in a test tube of the cold gel held horizontally for 0.5 or 1 hr. The consistency values are correlated with amylograph set back viscosity and can differentiate into three consistency types - low, medium, and high - even rice samples of similar amylose content as long as they are between 24 to 30%.

AA

2.52 Glyceroglycolipids in rice grain, Y.FUJINO and S.SAKAI, Cereal Chem., 1973, 50(4), 379.

Monoglycosyldiglyceride (MGDG) and diglycosyldiglyceride (DGDG) were isolated from the grain, identified and examined for composition of fatty acid as well as sugar constituents. MGDG was found to contain seven component acids, palmitic (51.4%), linoleic, (29.7%) and oleic (22.0%) being predominant and one component sugar, galactose, DGDG was observed to have eight component acids, including linoleic,(38.8%), oleic(19.2%), palmitic(18.8%) and linolenic (18.2%), and two component sugars, galactose (85.8%) and glucose (14.2%).

AA

2.53 The Biochemical basis of grain hardness in wheat, D.H.SIMMONDS, K.K.BARLOW, C.W.WRIGLEY, Cereal Chem., 1973, 50(5), 553.

The degree of adhesion between starch and protein probably accounts for hardness of wheat grains. A function of hardness of the grain is shown by the amount of solubles containing 30% protein and having protease, α- and β-amylase activities; the non-protein portion mainly consists of carbohydrates, on hydrolysis of which glucose with traces of xylose, arabinose and mannose are formed.

BSN

2.54 Conditioning studies on Australian wheat. II.Morphology of wheat and its relationship to conditioning, R.MOSS, J. Sci. Fd Agric., 1973, 24(9), 1067.

The difference in the rate of penetration of water inside the wheat kernel is attributed to the variations in thickness and composition of the outer cuticle and testa, the extent to which the outer epidermal and inner parenchymal cells have been compressed, and the number and size of protein masses present in the sub-aleurone endosperm cells.

KAR

2.55 Conditioning studies on Australian wheat III. The role of the rate of water penetration into the wheat grain, J.BUTCHER and N.L.STANWELL, J. Sci. Fd Agric., 1973, 24(9), 1077.

The penetration of water into the grain of a number of wheat varieties at various time intervals after damping was followed using the technique of auto-radiography. Significant varietal differences were found in the rate of water penetration and these were found to relate closely to the milling behaviour of the respective varieties at the various time intervals after damping.

AA

2.56 Conditioning studies on Australian wheat IV. Compositional variations in the bran layers of wheat and their relation to milling, J.WILSON LEE and N.L. STENVERT, J. Sci. Fd Agric., 1973, 24(12), 1565.

The rate of water penetration into the grain is explained in terms of the chemical composition of the bran. The degree of branching in bran arabinoxylans appears to be important; the more highly branched polysaccharide providing greater barrier to water movement. Lipid may also cause a retardation of water movement through the bran layers of the wheat grain.

KAR

2.57 Further studies on a specific basic protein from bread wheat, M.MINETTI, ANIS UR RAB, V.SILANO and F.POCCHIARI, J. Sci. Fd Agric., 1973, 24(11),1397.

The paper describes 'characterisation' studies on a specific cathodic protein (PCS) from an Italian bread wheat. The PCS isoelectric point was 9.1. About 80% of the total PCS in the seed can be extracted with water, and the rest by NaCl(30mM) solution; but these are identical in their immunological, electrophoretic and solubility properties. The bound PCS pool is concentrated in the seed outer layers whereas the unbound form had heterogeneous distribution.

KAR

2.58 Conditioning studies on Australian wheat.I. The effect of conditioning on milling behaviour, J. BUTCHER and N.L.STENVERT, J. Sci. Fd Agric., 1973, 24(9), 1055.

The effect of moisture level and lying time on the milling behaviour of a number of Australian wheat varieties was investigated. Significant differences were noted in the time required to reach optimum milling performance and this was also dependent on the level of water addition. This may be due to the variations in the rate of penetration of added moisture and the condition of the aleurone/sub-aleurone interface.

AA

2.59 Hydrated protein fibrils from wheat endosperm, J.E.BERNARDIN and D.D.KASARDA, Cereal Chem., 1973, 50(5), 529.

Microscopic fibrils of hydrated protein are observed when thin sections or particles of wheat endosperm tissue are wetted with a drop of water. These protein fibrils are pulled from broken endosperm cells by the surrounding flowing solution and exhibit both viscous flow and elastic deformation. Interaction between starch granules and protein is evidenced by the adherence of starch granules to the surface of the

protein fibrils which is clearly seen in scanning electron micrographs. The electron micrograph also indicates that the protein fibrils may be as small as 100 A in diameter.

AA

2.60 A comparative study of the amino acid composition of whole meal Atta and other milled products of wheat (T.aestivum), A.AUSTIN and V.P.AHUJA, Indian J. Nutr. Dietet., 1973, 10(5), 130.

The protein content of bran was 16.36 as against 13.39% for flour. Glutamic acid (32.49%) was higher in atta than in bran (21.28 g/100 g. protein) Lysine, methionine and threonine were lowest in flour, although it contained highest amount of leucine.

BSN

2.61 Structure and mineral composition of cereal aleurone cells as shown by scanning electron microscopy, Y.POMERANZ, Cereal Chem., 1973, 50(4), 504.

Scanning electron microscopy revealed basic similarities of aleurone cells in barley, oats, rye and wheat. The cell wall (S), the plasmale mma and the interior of the aleurone cell wall were investigated. The aleurone grains are embedded in a net work, which occupies the intergrain spaces. Various organelles and protrusions are confluent with the surface of the aleurone grain. Aleurone grains contain substantially greater quantities of mineral components than the aleurone cell wall. Relative concentrations of mineral components point to the presence of a potassium-magnesium, rather than a calcium-magnesium, salt of phytic acid as the main form of phosphorus in the aleurone grains of barley.

AA

2.62 Conversion of a weak flour to a strong, one by increasing the proportion of its high molecular weight gluten protein, F.MAC RITCHIE, J.Sci. Fd Agric., 1973, 24(11), 1325.

A weak, over-extensible flour was modified by additions of gluten fractions which had been obtained from the same flour. The physical dough testing characteristics of a strong, well balanced flour could be closely matched by additions of a suitably proportional mixture of the whole gluten and a high molecular weight protein fraction of the gluten, prepared by fractional extraction.

AA

2.63 A note on the effect of varying atmospheric pressure in the amylograph viscosity of flours, Cereal Chem., 1973, 50(5), 576.

Peak viscosity Brabender Unit (BU) values of flours increase approximately 3.5 and 9.5% at elevations of 2,500 and 5,000 ft respectively, over those obtained at sea level conditions. The changes in BU value were found to be significant statistically.

AA

2.64 Changes in flour proteins during dough-mixing. I. Solubility results, K.TANAKA and W.BUSHUK, Cereal Chem., 1973, 50(5), 590.

Extended mixing in the presence of relatively high concentrations of N-ethylmaleimide and potassium iodate was used to produce accentuated mixing breakdown. Exhaustive extraction of the proteins from the freeze dried doughs with 0.05N acetic acid indicated that under mixing conditions where doughs showed a marked decrease in consistency, the amount of protein soluble in this solvent increased markedly. With the decrease in the amount of insoluble protein, increases were observed in the amount of the alcohol soluble and acetic-acid soluble protein fractions.

AA

2.65 Changes in flour proteins during dough mixing II. Gel filtration and electrophoresis results, K.TANAKA and W.BUSHUK, Cereal Chem., 1973, 50(5), 596.

Gel filtration of Auc(0.1 M acetic acid), 3 M urea, 0.01M(etyltrimethylammonium bromide) extracts on sephadex G-150 showed that during mixing under conditions of accentuated dough breakdown there was a marked decrease in the high molecular weight glutenin. Concommittantly there was an increase in the amount of low MW glutenin and glialin. Dough mixing under normal and accentuated break-down conditions produced only minor changes in the sodium dodecylsulfate-polyacrylamide gel electrophoresis(SDS-PAGE) patterns of the protein fractions obtained by Osborne-type fractionation. The patterns of the alcohol-soluble fraction (gliadin) of doughs that suffered extensive mixing break-down, had several new bands in the high Mw-region. Components of the similar MW were observed in the patterns of reduced acetic acid-soluble and reduced residue proteins. The SDS-PAGE patterns of reduced acetic acid-soluble and residue proteins were essentially identical and were not affected by mixing under the conditions investigated.

AA

2.66 Changes in flour proteins during dough mixing.III. Analytical results and mechanisms, K.TANAKA and W.BUSHUK, Cereal Chem., 1973, 50(5), 605.

Chemical analysis showed that the number of sulfhydryl groups(SH) decreased during mixing in all doughs except in the controls mixed in nitrogen. The rate of loss was slightly different for three varieties of flour. The proteolytic activity and the content of aminogroups of the three flours increased with decreasing strength. There was no change in the amount of free lipid during mixing. A possible mechanism for the breakdown of doughs by excessive mixing (with or without SH reagents) is presented.

AA

2.67 The modification of wheat flour proteins with succinic anhydride, D.R.GRANT, Cereal Chem., 1973, 50(4), 417.

Treatment of wheat flour with succinic anhydride in aqueous suspension results in the conversion of 95% of the protein to derivatives soluble in water. Decreasing the pH below 5.0 results in precipitation of most of these derivatives. A substantial fraction was precipitated at 1% Na_2SO_4 concentration, but another fraction was insensitive to high salt concentrations. Sensitivity to low pH and salt concentration diminished as the dioxane content of the system increased. G-100 sephadex chromatography and viscosity studies indicated that the succinylated derivatives are more extensively disassociated in solution than untreated flour proteins in a dilute acetic acid extract. Polyacrylamide gel electrophoresis and ultra centrifugal analysis indicated that some association phenomena still occur unless the derivatives are dissolved in concentrated urea solutions. Gel electrophoresis of native and succinylated solutions of serum albumin, pepsin and lysozyme indicated that the succinylation of a single protein species is likely to produce a heterogenous product.

AA

2.68 Some properties of starches derived from wheat of varied maturity, K.KULP, Cereal Chem., 1973, 50(4),496.

Physico-chemical and baking characteristics of starch from hard winter wheat (Gage variety) harvested at time of full maturity and 1,2 and 3 weeks prior to this stage were investigated. Determination of iodine affinity indicated a progressive increase of apparent amylose content with maturity. Viscographic measurements showed that not paste consistencies increased with maturity. The gelatinization temperature ranges were depressed with progressive maturity. While starch solubilities did not change appreciably, swetting powers and hydration capacities decreased with the maturity of the wheat. The starch from mature wheat was more susceptible to the action of amylases than that from immature wheat. Starch from fully matured wheat produced breads of higher loaf volume than that isolated from immature wheat.

AA

2.69 A note on Ferulic acid as a constituent of the water-insoluble pentosans of wheat flour, T.GEISSMANN and H.NENKOM, Cereal Chem., 1973, 50(4), 414.

TLC studies have confirmed the presence of bound ferulic acid in wheat starch tailings obtained from a wheat starch factory.

BSN

2.70 Condensed phosphatases for precipitation of protein from gluten-washing effluent, J.W.FINLEY, M.A.GAUGER and D.A.FELLERS, Cereal Chem., 1973, 50(4), 465.

Washing wheat flour doughs for production of vital gluten and starch produces a waste effluent containing from 1 to 6% solids. Such effluents were treated with various condensed phosphates at pH levels 2.0 to 8.0 to complex and precipitate proteins. Metaphosphate, pyrophosphate, tripolyphosphate, trimetaphosphate, tetrametaphosphate and hexametaphosphate were studied. Lower pH was generally more effective especially with hexametaphosphate. Nearly 90% of the protein can be precipitated and recovered. Gel electrophoresis and gel filtration suggest that various phosphates were specific for various proteins in the effluent. The excess phosphates can be removed from residual effluent after protein removal by treatment with calcium ions at neutral or slightly alkaline pH. Treatment of the protein precipitates with alkali resolubilizes the protein and the phosphate can then be removed by ion exchange.

AA

2.71 Chance of glutamic acid runs in gliadins and caseins, J.A.D.EWART, J. Sci. Fd Agric., 1973, 24(9), 1097.

Probability calculations based on amino acid compositions show that $(Glx)_5$ and more than one $(Glx)_4$ will almost certainly occur in wheat gliadin, provided that the amino acid sequences conform approximately to a random pattern. $(Gln)_6$ is probable. $(Glx)_3$ is likely to be the longest run in caseins. No major departures from a random arrangement were observed in calculations on the standard proteins of known sequence.

AA

2.72 Isolation and characterization of gliadin like subunits from glutelin, J.A.BIETZ and J.S.WALL, Cereal Chem., 1973, 50(5), 537.

The polypeptide subunits of wheat glutelin obtained after reductive cleavage of disulfide bonds have been separated into two fractions by modified Osborne technique. Approximately 62% of the subunits by weight are soluble, as is gliadin, in neutral 70% ethanol; the ethanol soluble subunits are mainly 44,000 molecular weight (M.W). The ethanol-insoluble glutenin sub-unit fraction is markedly different in amino acid composition and consists of high MW sub-units, and some of lower MW. Sodium dodecyl sulfate electrophoresis, starch-gel electrophoresis, and amino acid analysis suggested that some ethanol soluble sub-units of reduced glutelin may be equivalent to subunits of high MW gliadin. To test this possibility, both fractions were reduced and alkylated and 44,000-MW subunits were isolated and partially characterized.

AA

2.73 Large-scale preparation of gliadin proteins, ALAN L. PATEY and DAVID J.EVANS, J. Sci. Fd Agric., 1973, 24(10), 1229.

By combination of carboxymethyl cellulose ion-exchange chromatography and gel filtration α, β and γ-gliadin proteins have been isolated in quantities large enough for baking tests.

AA

2.74 The nature of the starch-protein interface in wheat endosperm, K.K.BARLOW, M.S.BUTTROSE, D.H.SIMMONDS and M.VESK, Cereal Chem., 1973, 50(4), 443.

The entire area between starch granules is filled with material staining as protein. Water soluble proteins are confined to a position immediately surrounding starch granules and this area is capable of rapid swelling on hydration. There is evidence that residues of the original amyloplastmembranes, as well as those of endoplasm reticulum exist around starch granules. The soluble proteins associated with starch granules form an electrophoretically complex group. Associated with them are carbohydrates giving rise to glucose on hydrolysis. The total water soluble appears to play the role of a cementing substance between starch granules and storage protein.

AA

*2.75 Studies on polyphenol oxidase in wheat grain, S.TIKOO, J.P.SINGH, Y.P.ABROL and R.C.SACHAN, Cereal Chem., 1973, 50(4), 520.

Polyphenol oxidase was partially purified from the bran fraction of mature grains of tall and dwarf varieties of wheat. The specific activity of enzyme in dwarfs is distinctly higher than in tall varieties. Further, the stable substrate specificity studies showed that diphenols are efficient substrates, whereas mono- and polyphenols are poor substrates. Fractionation of isoenzymes of polyphenol oxidase on acrylamide gel electrophoresis revealed three to five bands. Usually the isoenzymes of dwarf varieties are more stable on storage at 4°C than their counter parts in the tall varieties.

AA

2.76 Application of low dose irradiation to fresh bread system for space flights, T.E.HARTUNG, L.B.BULLERMAN, R.G.ARNOLD and N.D.HEILDELBAUGH, J. Fd Sci., 1973, 38(1), 129.

Irradiation pasteurization of flour and bread at 50,000 rads markedly reduced their microflora when stored at 21-25°C. Chemical measurements like TBA values, gas chromatography of bread volatiles, and infra-red

scanning of the bread lipids did not show any major influences due to the irradiation process. After short-term storage a new compound, identified as propionaldehyde appeared. Panel evaluations could not distinguish aroma, appearance, flavour, texture or freshness differences attributable to the irradiation process.

KAR

2.77 Effect of spaghetti processing on semolina carbohydrates, C.LINTAS and B.L.D.APPOLONIA, Cereal Chem., 1973, 50(5), 563.

The pasting properties, water-binding capacity and starch damage value of isolated starches were all affected by processing and drying. Considerable difference in the amounts ofglucose and maltose were seen in semolina and spaghetti.

AA

2.78 Lysine fortification of commercial bulgur, F.K.SHOUP and T.E.HENRY, Cereal Chem., 1973, 50(5), 571.

A colorimetric method using ninhydrin as the reactant was used as a quality control method for determination of L-Lysine monohydrochloride. Variation of inter-laboratory results indicated the method was inadequate at the desired level (0.10%) of fortification. Growth studies indicated an increase in protein efficiency ratio when rats received bulgur fortified with lysine. Analytical and biological studies also indicated losses of lysine upto 65% when added before cooking.

AA

2.79 Corn germ protein isolate - preliminary studies on preparation and properties, H.C.NIELSEN, G.E.INGLETT, J.S.WALL and G.L.DONALDSON, Cereal Chem., 1973, 50(4), 435.

Commercial corn germ was extracted with hexane and ground to a meal. Protein was solubilized by two extractions in a high speed blender at either 10:1 or a 5:1 solvent:meal ratio. The first solvent was water containing 10 m.e. sodium hydroxide per g. germ meal (pH 8.7), the second being only water. Protein in the extract was precipitated by adjusting to isoelectric pH (4.7). The protein precipitate, after being washed with water was adjusted to pH 7.0 and freeze-dried. The neutralized isolate extracted at a 5:1 solvent meal ratio was dialyzed against distilled water for 48 hr. to reduce ash content before freeze-drying. Proximate analysis of the dialyzed isolate was 71% protein(Nx5.1): 4.3% ash, most of which was phosphate; and a 0.08% fiber. The protein in the isolate contains 6% lysine with a good balance of other essential amino acids. Mild flavour, light tan colour, solubility at neutral and low pH and ability to stabilize an oil-in-water emulsion

are
/some properties of this corn germ protein isolate that indicate its potential for many food uses.

AA

2.80 Suppression of fungal growth of isolated trypsin inhibitors of corn grain, ABDUL H.HALIM, CLYDE E. WASSOM, HOWARD L.MITCHELL and LEON K.EDMUNDS, J.agric. Fd Chem., 1973, 21(6), 1118.

Isolated corn trypsin inhibitor retarded growth of six fungi when added to dextrose agar cultures at time of inoculation. Greatest activity was against Fusarium roseum and least was against Helminthosporium maydis.

AA

2.81 Classification of corn odour by statistical analysis of gas chromatographic patterns of headspace volatiles, A.DRAWILKS, H.G.REILICH, J.WHITFIELD and C.A.WATSON, J. Fd Sci., 1973, 38(1), 34.

The possibility of classifying corn odour on the basis of gas chromatographic patterns of head space volatiles was studied using 60 samples of corn and statistical step-wise discriminant and regression analyses and it was found that an objective system is feasible for classification of grain odour.

KAR

2.82 Distribution and heat inactivation of peroxidase isoenzymes in sweet corn. E.E.CHECHIN and H.Y.YAMAMOTO, J.Fd Sci., 1973, 38(1), 40.

The isoenzyme content of pericarp, germ and endosperm was very complex with pericarp having the largest number of isoenzymes. No fraction of the peroxidase isoenzyme was completely heat resistant (at 76°C) although most bands did contain some heat resistant forms.

KAR

2.83 Reactions of oligosaccharides. III. Hygroscopic properties, B.J.DONELLY, J.C.FRUIN and B.L.SCALLET, Cereal Chem., 1973, 50(4), 512.

Dried samples of corn starch hydrolysates were exposed to r.h of 25,56,75 and 90% at 75°, 86° and 100°F. It was found that oligosaccharides have almost the same moisture adsorptive powers, while the mono,- and disaccharides vary widely in their hygroscopicities at different r.h, particularly at higher r.h. ranges.

BSN

2.84 Sorghum protein ultrastructure as it relates to composition, H.L.SEIBINGER and W.J. CLF, Cereal Chem., 1973, 50(4), 455.

Vitreous endosperm shows a well developed two component structure consisting of protein bodies embedded in a matrix protein. The aqueous alcohol-soluble fraction (prolamine) proved to be the major component of globular protein bodies. The surrounding matrix protein consisted mostly of glutelin. Globular protein bodies have a nucleus that is insoluble in aqueous alcohol. Protein bodies of almost all grain sorghums were 2 to 3 /um in diameter. Distribution of protein within the sorghum kernel is similar to that of other cereal grains. The peripheral vitreous area of the kernel is rich in protein; interior areas have smaller amounts of protein. Microscopic observations show that protein bodies make up the major part of sorghum endosperm protein.

AA

2.85 The in vivo and in vitro degradation of barley and malt starch granules, G.N.BATHGAT AND G.J.PALMER, J. Inst. Brew., 1973, 79(5), 402.

The large starch granules from barley were hydrolysed by alpha-amylase at a slower rate than in malt. The small grains are resistant to alpha amylase activity and their hydrolysis is not facilitated appreciably even by precooking. The small grains from malt were hydrolysed more easily than the small grains from barley. During malting small grains are more rapidly hydrolysed than big grains but this position is reversed during mashing.

JVS

2.86 Isolation and properties of trypsin and chymotrypsin inhibitors from barley grits after storage, J.R. WARCHALEWSKI and J.SKUPIN, J. Sci. Fd Agric., 1973, 24(9), 995.

Due to storage for 6 months at -10°C, the freeze dried albumin of barley grits lost its antiproteolytic activity and a proteolytic activity appeared. The first trypsin-chymotrypsin inhibitor B_7, inhibits at concentrations of 2.5 /ug, 1 /ug of crystalline trypsin and 1.9 /ug of this inhibitor inhibits 1 /ug of crystalline alpha-chymotrypsin. The second inhibitor of chymotrypsin ($B_{7.4}$) needed 4.8 /ug to inhibit the activity of 1 /ug of crystalline alpha-chymotrypsin.

KAR

.87 Oat protein concentrates from a wet milling process: Composition and properties, Y.U.WU, J.E.CLUSKY, J.S.WALL and G.L.MCLETT, Cereal Chem., 1973, 50(4), 481.

The concentrates, which have a bland taste, contain from 59-75% protein (Nx6.25) with 3.9-4.1 g lysine and

3.3 - 4.3 g. total sulfur amino acids per 16 g. nitrogen. The concentrates are low in fiber (0.1-0.2%), have 3.5 - 4.5% ash, no starch and from 2.2 - 23.3% total carbohydrates. Protein concentrate from Garland groats has 10.1% fat, whereas defatted Wyndmere groats gave a protein concentrate with 0.3% fat. The starch fraction is essentially composed of pur starch without any other carbohydrate. Protein concentrate from Garland groats has 10.1% fat, whereas defatted Wyndmere groats gave a protein concentrate with 0.3% fat. Protein concentrate from defatted Garland groats has a nitrogen solubility of 83% at pH 2.1, a minimum solubility (15%) around pH 5.0 and 95% solubility at pH 11.4.

AA

2.88 Oat protein concentrates from a wet milling process: preparation, J.E.CLUSKEY, Y.V.WU, J.S.WALL and G.E.INGRETT Cereal Chem., 1973, 50(4), 475.

Optimum yield of protein was obtained in dilute alkali solution (pH 9). Starch and protein were separated from bran by sieving the alkaline dispersion. After the fine suspension was centrifuged to separate pure starch (0.05% nitrogen), the protein solution was adjusted to pH 6 and freeze-dried. The protein content (Nx6.25) of the concentrate varied between 59 and 89% depending on the dry milled fraction and process used and accounts for upto 88% of total protein in the starting material.

AA

2.89 Protein concentrates from oat flours by air-classification of normal and high protein varieties, Y.V.WU and A.C.STRINGFELLOW, Cereal Chem., 1973, 50(4), 489.

Air classification of oat flours produced a unique fraction (83-88% protein) not observed previously for wheat, rye, corn, sorghum or triticale flours. This fraction (2 to 5% by weight) accounted for 14, 16 and 7% respectively, of the total protein in the first and second flours and groats. The next fraction (25-29% by weight) with 15-39% protein accounted for total protein from flours of 38-48%, and with 21-29% protein from groats, 31-33%. The first and second flours gave a better air classification response than ground groats and the high protein variety gave better results than normal protein oats. Amino acid analysis of all fractions indicated high lysine levels from 3.9 - 5.0 g/16 g nitrogen and adequate total sugar amino acids.

AA

See also

Absorption of fortified iron in bread 17.31
Absorption of fortified iron in cereals by rat, 17.32
Aflatoxin contamination of corn, 15.43
Bedonin osteomalacia due to calcium deprivation caused by high phytic acid and unleavened bread, 17.29
Lysine supplemented wheat feeding trials on humans, 17.26
Nitrogen balances of adult humans fed blends of wheat, beans, corn, milk and rice, 17.18.
Nitrogen balance in rats fed rice, 17.19
Nutriene V (maize, beans and milk blend) feeding to undernourished children, 17.23
Protein quality of rice polish and combinations with peanut flour, FPC and lysine, 17.24.

3. PULSES

3.4 The nutritional evaluation of kidney beans(Phaseolus vulgaris). The effect on nutritional value of seed germination and changes in trypsin inhibitor content, J.Sci. Fd Agric., 1973, 24(8), 937.

The total N content of kidney beans (Phaseolus vulgaris) was found to increase on germination. The overall amino acid content changed very little. Germination was found to bring about a gradual improvement in nutritive value probably through the elimination of some of the toxic constituents of the seed.

KAR

3.5 A study of lipoxidase in pea seeds and seedlings, M.HAYCLAR and HADZIEV, J. Sci. Fd Agric., 1973, 24(9), 1039.

Lipoxidase was isolated, and partly purified from pea seeds by ultracentrifugation, ammonium sulphate precipitation, sephadex and DEAE-cellulose column chromatography. The pH optimum of the enzyme was 7.2 and the Michaelis-Menton constant 2.3×10^{-3}M. gave a molecular weight of 7.4×10^{4}. The presence of enzyme in pea mitochondria and in the peroxisome like bodies was demonstrated. The enzyme was found to be compartmentalised in any particulate fraction of the pea seedlings investigated.

KAR

See also

Manioc flour as a methionine carrier to balance bean-based diets, 17.27
Nitrogen balances of adult humans fed blends of wheat, beans, corn, milk and rice, 17.18
Nutriene V (maize, beans and milk blend) feeding to undernourished children, 17.23.

4. FRUITS, VEGETABLES & TUBERS

4.49 Spectrophotometric determination of dehydroacetic acid (DHA) in fruits and vegetables, T.S.PIWOWAR, J.Ass.off.anal.Chem., 1973, 56(5), 1270.

The samples (bananas, strawberries and zuchhini squash) are blended and extracted with chloroform. The chloroform extract is cleaned-up on a preparatory silicic acid - glass fibre sheet. The DHA is determined by its UV absorbance at 307 nm. The average recovery of DHA added at levels of 5-80 ppm was 100±4.8%. The method is sensitive to 2 ppm DHA.

AA

4.50 Fluorodensitometric determinations of quinine in soft drinks, P.R.BELJAARS and P.J.KOKEN, J. Ass.off.anal. Chem., 1973, 56(5), 1284.

The samples such as tonic water, lemonades, and fruit juices are treated with a alkaline mixture of methanol-ammonia (483+15), followed by TLC on silica gel plates. The plates are developed with a mixture of chloroform-methanol-acetic acid (80+20+3), and the developed plates are scanned with a reflectance flying spot densitometer. The relationship between recorded peak area and concentration of bluish fluorescent standard spots is linear for 0.1-1.0 mcg quinine $HCl.2H_2O$.

AA

4.51 Determination of sucrose diacetate hexaisobutyrate in soft drinks by GLC analysis of isobutyric and acetic component as decyl esters, H.B.C.COWLCHER, R.K.CHADHA and J.R.IYENGAR, J. Ass. off. anal. Chem., 1973, 56(5), 1264.

The method involves an acid catalysed transesterification of the sucrose, esters with sulfuric acid in decanol followed by GLC analysis of the resulting decyl acetate and isobutyrate using hexanoic acid as the internal standard. Recoveries of sucrose diacetate hexaisobutyrate from drinks fortified with this compound ranged between 92.8 and 97.8% in calculations based on acetic acid content and between 97.1 and 99.3% in those based on isobutyric acid.

AA

4.52 Effect of some citrus juice constituents on taste thresholds for limonin and naringin bitterness. D.G. guadagni, V.P.MAIER and J.G.TURNBAUGH, J.Sci.Fd Agric., 1973, 24(10), 1277.

A panel of judges determined the threshold for pure limonin and naringin in distilled water, sucrose solutions. Citric acid solutions adjusted to various pH values. Thresholds in distilled water were 1 and 20 mg/l for limonin and naringin respectively. In

model systems highest thresholds were obtained at low pH values in the absence of sugar. In a 1.2% citric acid solution containing 5% sucrose, 2.5% dextrose and 2.5% fructose the maximum limonin threshold of 11 mg/kg was obtained at pH 3.8. The maximum difference threshold for limonin in orange juice was 6.5 mg/kg. The optimum pH for limonin bitterness suppression was 3.8.

KAR

4.53 Effect of pre-harvest sprays on the storage behaviour of Navel Orange during an export season, B.M.EL-ZEFTAWI and I.D.PEGGIE, Fd Technol. Aust., 1973, 25(7), 359.

Pre-harvest spray with 2,4-D at 10 ppm+Gibberellic acid (GA) at 10 ppm with 2,4-D at 15 ppm was tried. The storage quality of Washington Navel orange was higher than that of Leng Navel Orange and pre-harvest treatment with 2,4-D+GA improved it.

KAR

4.54 De-greening of Valencia Oranges, B.M.El-ZEFTAWI, Fd Technol Aust., 1973, 25(9), 449.

De-greening of re-greened Valencia Oranges is achieved by Ethephon as a pre-harvest spray or post-harvest dip in water or in TBZ or Benomyl solution. Benomyl, however, delays the de-greening effects of Ethephon.

AA

4.55 Distribution of (14C) Ethylene and the incorporation of radio carbon in 'Valencia' oranges after exposure to (14C) Ethylene, J.F.FISHER, J.agric. Fd Chem., 1973,21(6),1106

Externally applied (14C) ethylene was found to distribute throughout the internal environment of the orange. Radio carbon was incorporated into the ether soluble material and fractions containing amino acids, organic acids and the 80% ethyl alcohol-soluble carbonhydrates. The greatest activity was/the ether-soluble and organic acid fractions. Citric acid was found to be radioactive.

/in

AA

4.56 Persistence of residues of the insecticide phosphamidon on and in oranges, lemons, and grape fruit, and on and in orange leaves and dried citrus pulp cattle feed, WILLIAM E.WESTLAKE, MONIKA ITTIG, DANIEL E.OTT and FRANCIS A.GUNTHER, J.agric.Fd Chem., 1973,21(5),846.

Dosages from 0.5 to 1.5 lb/acre yielded maximum initial deposits of about 1.5 ppm (rind basis) which decreased to about 0.1 ppm(rind basis) after 28 days. Residues declined slightly more rapidly on leaves than on fruit. The persisting residues on all varieties of fruit and on orange leaves remained largely on the surface for as

long as 28 days after application. The highest level detected as a result of translocation into edible portion of any of these tissues was 0.002 ppm in lemon juice sacs 1 day after application. The cis isomer of phosphamidon disappeared slightly more rapidly than the transisomer. N-Desethylphosphamidon was not detected in any sample (< 0.02 ppm). About 90% of the phosphamidon in orange rind (0.04 ppm, [illegible] sample) was lost in processing the rind into dried citrus pulp cattle feed.

AA

4.57 Nature of Xanthophyll esterification in grape fruit, THOMAS PHILIP, J. agric. Fd Chem., 1973, 21(6), 963.

The isolation and characterization of laurate esters of cryptoxanthin, violaxanthin, auroxanthin, β-citraurin, and reticulataxanthin from the peel and pulp of Valencia oranges.

AA

4.58 Fluorometric determination of Limonin in grape fruit and orange juice, JAMES F.FISHER, J.agric. Fd Chem., 1973, 21(6), 1109.

Microgram quantities of limonin were determined after separating it from citrus juice by solvent extraction and column chromatography. Further purification was accomplished by converting the crude limonin into water extractable limonate, which was reconverted to chloroform extractable limonin. Isolated limonin was measured fluorometrically in concentrated sulfuric acid.

AA

*4.59 Relationship of aroma and flavour characteristics of mango (Mangifera indica L) to fatty acid composition, C.BANDYOPADHYAY and A.S.GHOSAL, J. Sci. Fd Agric., 1973, 24(12), 1497.

During the ripening of Alphonso mango at ambient temperature (25 to 30°C) there was an increase in the glyceride content of the pulp, followed by rapid changes in fatty acid composition and in aroma and flavour, while at low temperature (10±2°C) there were no appreciable changes in glyceride content and fatty acid composition of the pulp or in aroma and flavour. A correlation was ascertained between organoleptically evaluated aroma and flavour characteristics of mango pulp and the ratio of palmitic acid to palmitoleic acid.

AA

4.60 Utilization of mango kernel, J.P.MITTAL and BHAGWAN SINGH, Res & Ind., 1973, 18(1), 26.

Mango kernel may be used for preparation of pickles, flour and starch and employed also as a cattle feed. A decorticator designed with a capacity to handle one quintal of dry stones per hour is described. On separation of hard and fibrous outer pericarp, the inner kernel possessing nutrients may be obtained.

BSN

4.61 Comparison of a standard fibre board carton and a wooden box for the packaging of banana hands, L.E.RIPPON, Fd Technol., Aust., 1973, 25(9), 492.

Injury and weight loss were less for fruits in cartons than for that in boxes. Lining the containers decreased injury especially in boxes and decreased weight loss.

LA

4.62 Changes in ethylene and CO_2 during the ripening of apples, M.S.REID, M.J.C.RHODES and A.C.HULME, J.Sci. Fd Agric., 1973, 24(9), 971.

In Cox's Orange Pippin apples, within 12 hr. of the onset of the respiration climacteric, there was no measurable increase in the production of ethylene and the increase in ethylene production is synchronous with the increased CO_2 production that marks the start of ripening.

KAR

4.63 Composition of the surface waxes of apple fruits and changes during storage, I.M.MONIC and F.B.SHORLAND, J.Sci.Fd Agric., 1973, 24(11), 133.

The hydrolysed surface waxes of apples at harvesting consisted of 57 to 62% acids, 21 to 26% hydrocarbons, 7% primary alcohols, 3 to 5% secondary alcohols and 4 to 7% other constituents. The hydrocarbon homologues ranged from C_{18} to C_{31}; the primary alcohols were mainly n-hexacosanol., n-tetracosanol depending upon variety, the secondary alcohols were consisted of nonacosan-10-ol. The amount and composition of waxes and the fatty acid composition changed depending upon the variety; a 11-fold increase in linolenic acid content was also noticed.

KAR

4.64 Effect of controlled atmosphere storage on respiratory metabolism of apple fruit tissue, MICHAEL KNEE, J.Sci.Fd Agric., 1973, 24(10), 1289.

CO_2 at 10% level inhibited CO_2 release from succinate supplied to peel discs; CO_2 release from malate was inhibited at high substrate concentrations, while CO_2

dehydrogenase is the respiratory enzyme most affected by CO_2 concentration. Oxygen uptake was inhibited(50%) at ambient concentrations of 0.5% O_2 for cortical tissue and 5% O_2 for peel tissue. Cytochrome oxidase was found to be responsible for O_2 uptake in peel and cortical tissue. KAR

4.65 Effect of gamma radiation on D glucose present in apple juice, D.BARALDI, J.Fd Sci., 1973, 38(1), 108.

Irradiation at 1Mrad levels gave upto 11 components in acidic fraction as degradation products of D-glucose; among them were gluconic, glucuronic, and glycolic acids. No radiation induced aldehyde or ketone compounds were found. KAR

4.66 Apple press cake powder, J.L.BOMBEN and D.G.GUADAGNI, Fd Technol. Aust., 1973, 25(8), 414.

Details of preparing an apple-flavoured thickner from apple press cake.

4.67 Organic acid and sugar contents of seuppernong grapes during ripening, I.A.JOHNSON and D.L.CARROLL, J.Fd Sci., 1973, 38(1), 21.

At the ripe stage malate and tartarate constituted approximately 90% organic acids with trace quantities of pyruvic, fumaric, succinic, citric and quinic acids in Seuppernong (V.rotundifolia) grapes. Glucose, fructose and sucrose constituted approximately 90% of the sugars with trace quantities of galactose and maltose. Malate concentration increased during the early stages of ripening, peaked and to a plateau at the ripe stage. Tartarate decreased steadily until it levelled at the ripe stage. Sugars began to accumulate at version, increased rapidly thereafter and levelled at the ripe stage.

KAR

4.68 Quantitative determination of sorbitol in raisins and dietetic foods by gas-liquid partition chromatography, E.FERNANDEZ FLORES and V.M.BLONQUIST, J.Ass.off.anal. Chem., 1973, 56(5).

Sorbitol is converted to a trimethyl silyl derivative after precipitation of interfering organic acids as lead salt and determined by GLC-using alpha-D-glucoheltose as an internal standard. The recovery of 0.5% sorbitol added to raisins was 93%.

.A

4.69 A procedure for quantitative estimation of malic and tartaric acids of grape juice, T.PHILIP and T.E.NELSON, J.Fd Sci., 1973, 38(1), 18.

The ion exchange behaviours of succinic, malic and tartaric acids on Amberlite resins are evaluated. A procedure for the purification of grape juice by use of ion exchange resins prior to gas chromatography is described.

KAR

4.70 Sensory evaluation of high-moisture dried prunes preserved with sodium benzoate, DANTE G.GUADAGNI and JOHN E.SCHADE, J.Sci. Fd Agric., 1973, 24(8), 913.

Both sodium benzoate and potassium sorbate were significantly detected ($P \leq 0.05$) in prune juice at levels of 500 to 600 parts/million. Detection levels for both preservatives in high moisture dried prunes were higher (about 800 ppm). Sodium benzoate and potassium sorbate used at equal effective levels in high moisture dried prunes did not show any flavour differences.

KAR

4.71 Preservation of high-moisture dried prunes with sodium benzoate instead of potassium sorbate, JOHN E.SCHADE, ALLEN E.STAFFORD and A.DOUGLAS KING JR, J.Sci.Fd Agric., 1973, 24(8), 905.

An attempt was made to use sodium benzoate for high moisture content (31 to 38%) prunes instead of potassium sorbate which is not permitted in dried fruits in Japan and U.K. Sodium benzoate is generally effective against the yeast and moulds but potassium sorbate was more effective against the mould than yeasts. It appeared that it would take 40 to 90% more sodium benzoate than potassium sorbate still dried prunes can be preserved with sodium benzoate not exceeding the U.S. legal limit of 0.1%.

KAR

4.72 Scatter of near-infra red radiation by cherries as a means of pit detection, S.E.LAW, J.Fd Sci., 1973, 38(1), 102.

The magnitudes of forward scatter and scatter at right angles were used to form a pit detection parameter which was studied as a function of certain variables encountered in processing lines. Surface colour, degree of scalding, and size were found in most cases to have little effect on the parameter while cherry orientation has a great effect.

KAR

4.73 Determination of maleic hydrazide ("MH") residues in tobacco and vegetables, M.IHNAT, R.J.WESTERBY and I.HOFFMAN, J. Ass.off.anal.Chem., 1973

The sample is boiled in HCl solution and volatile interference eliminated by steam distillation. The MH is hydrolysed in the presence of NaOH and Zn and the hydrazine produced is steam distilled into H_2SO_4 solution. The distillate is heated to reduce volume and other interferences are removed with Norit A. p-dimethyl amino-benzaldehyde is added and MH is spectrophotometrically estimated at 455 nm.

JVS

4.74 Evaporative cooling of blanched vegetables, R.J. COFFELT and F.H.WINTER, J.Fd Sci., 1973, 38(1), 89.

Results show that air velocity is the critical factor involved in evaporative cooling.

4.75 Effects of nitrogen nutrition and day temperature on composition, colour, and nitrate in tomato fruit, B.S.LUH, N.UKAI and J.I.CHUNG, J. Fd Sci., 1973, 38(1), 29.

Tomatoes from fertilized plants (+N) had higher titratable acidity, lower solids content, higher total, amino, ammonium and nitrate nitrogen than those -N series. Fruits ripening at high day temperature were poor in colour while those ripening at below 30°C were more attractive in colour. Low day temperature results in accumulation of nitrate due to low nitrate reductase activity.

KAR

4.76 Preservation of carrots by lactic acid fermentation, G.K.NIKETIC-ALESKSIC, M.C.BOURNE and J.R.STAMER, J.Fd Sci., 1973, 38(1), 84.

Carrots fermented either by naturally occurring microflora of the raw carrot or by homofermentative and heterofermentative lactic acid bacteria attained total acid of over 1% (expressed as lactic acid) following 21 days incubation. The lactic acid fermentation arose as a result of homofermentative flora. Mild heat treatment of the high acid product at 71°C produced no adverse changes in colour or texture.

KAR

4.77 A process for producing pumpkin dehydrated flakes, M.W.HOOVER, J. Fd Sci., 1973, 38(1), 96.

Single strength pumpkin puree is difficult to drum dry; addition of corn syrup (38%) and starch (16%) to pumpkin solids (46%) improved the quality of the product and the drying condition.

KAR

4.78 Changes in chloroplast pigments during the p... of leaf protein, DAVID B.ARKCOLL B.ARKCOLL and ... HOLDEN, J.Sci.Fd Agric., 1973, 24(10), 1217.

Loss of carotenoids during pulping and pressing of ... leaves is mainly enzymic and can be minimised by adding alkali and processing quickly. Carotenoids were more stable in the juice than in the fibre. Little carotene was destroyed on heating the juice; coagulation is preferably done at higher temperatures (100°C). ... with acid converted the chlorophylls to pheophytins and chlorophyllides to pheophorbides; xanthophyll decreased slightly but carotene was unaffected. No pigment changes occurred on freeze drying. During storage with air present carotene was less stable than xanthophyll; carotenoids were lost faster from acid washed LPs than from unwashed preparations.

KAR

4.79 Aspects of vegetable structural lipids. I. The lipids of leaf protein concentrate, B.J.F.HUDSON and I.G.KAPIS, J. Sci. Fd Agric., 1973, 24(12), 1544.

Leaf protein concentrates contain 10% or more of lipids which have been analysed in detail with a view to establishing both the classes of lipid present and their component fatty acid profiles. Variable factors such as the species of crop, its degree ofmaturity and the cellular origin of the concentrate fraction have important influence on lipid patterns and on yields.

KAR

*4.80 Thin layer chromatographic investigation of color developer involved in pinking of white onion purees, C.BANDHYOPADHYAY and G.M.TEWARI, J. agric. Fd Chem., 1973, 21(6), 952.

Of the three compounds isolated by TLC, the major one was found to be thiopranal S-oxide; The other two were tentatively identified as thioalkanal-S-oxide type of compounds.

BSN

4.81 Nitrate and Nitrite content of market potatoes, EDWARD G.HEISLER, JAMES SICILIANO, SAMUEL KRULICK, WILLIAM L.PORTER and JONATHAN W.WHITE, JR, J.agric. Fd Chem., 1973, 21(6), 970.

An overall average content of 120 ppm of nitrate and 0.44 ppm of nitrite were found in 99 market potato samples analysed.

BSN

4.82 Recovering potato proteins coagulated by steam injection heating, EUGENE C.STOLLE, J.M.[illegible] CO[illegible] JR, and NICHOLAS C.[illegible]CO, J. agric. Fd Chem., 1973, 21(6), 974.

For recovery ofproteins from potato starch factory effluent, the method suggested is acidification of effluent to pH 5.5 or less, heating to at least 99° pressure, filtering in frame filter press and drying the protein on a double drum drier.

BSN

4.83 Effect of relative humidity, temperature and length of storage on decay and quality of potatoes and onions, L.VAN DEN BERG and C.P.LENTZ, J. Sci Fd Agric., 1973, 38(1), 81.

Storage at 0-10°C indicated that for potatoes the optimum relative humidity was 98-100% and this minimized the moisture loss, reduced decay and maintained firmness and a thin skin. Onions preferred a lower humidity, those stored at 98-100% RH were firmer and juicier than those held at 75-95% RH.

KAR

4.84 Effect of finish frying conditions on the quality of French fried potatoes, J.M.ZAK and C.HOLT, J. Fd Sci., 1973, 38(1), 92.

Partial thawing or refreezing of samples before finish frying may result in the non-uniform distribution of moisture within the strips and decrease rigidity and increase limpness of the finished product. Optimum frying conditions were 2.75 min. at 360°F. The limpness and rigidity factors of samples deteriorate after finish-frying and this process is accelerated by exposure to infra-red heat lamps.

KAR

4.85 Volatile components of baked potatoes, R.G.BUTTERY, D.G.GUADAGNI and L.C.LING, J.Sci. Fd Agric., 1973, 24(9), 1125.

The components most important to baked potato aroma include 2-ethyl-3,6-dimethylpyrazine, 3-methylbutanal, propanal (methional), deca-trans, trans-2,4-dienal and possibly 2-ethyl-3,5-dimethyl pyrazine. Skin showed greater proportions of pyrazines to aldehydes.

KAR

See also

Analysis of organic acids in fruit products, 13.14
Aroma of olive oil, 6.20
Availability of iron to children fed Amaranthus cooked in two different utensils, 17.30
Detection of almond oil with apricot oil, 6.21
GLC determination of beta-asarone of oil of calamus in flavours and beverages, 12.26
Manioc flour as methionine carrier to balance common bean-based diets, 17.27
Texture improvement in fresh pack dill pickle, with lactose and sucrose, 19.14

5.10 Influence of drying temperature at harvest on major volatiles released during roasting of peanuts, C.T. YOUNG, J. Fd Sci., 1973, 38(1), 123.

Drying at higher temperatures (160°F) resulted in an increase in hydrogen sulphide, total base, dicarbonyl compounds and total carbonyls (hydrazones).

K.R

5.11 **Effect of processing** pH on the properties of peanut protein isolates and oil, K.C.RHEE, C.M.CARTER and K.F.MATTIL, Cereal Chem., 1973, 50(4), 395.

The maximum recoveries of both protein and oil from raw peanuts were obtained at pH 8.0, and extraction pH values higher than 8.0 considerably reduced the protein solubility of the isolates with no significant increases in the recovery of proteins. Higher pH values also increased the loss of oil through saponification. All four isolates remained stable when heated: no protein coagulation occurred even if isolates were heated at 95°C. for 30 min: solution viscosities were quite low at all protein concentrations as compared to other vegetable proteins, and the pH of extraction and precipitation of the isolate significantly influenced viscosity characteristics.

A.A.

*5.12 Variability in fatty acid composition in peanut. II. Spreading group, K.S.SEKHON, K.L.AHUJA, SATVIR JASWAL and I.S.BHATIA, J. Sci.Fd Agric., 1973, 24(8), 957.

Oil content and fatty acid composition of 50 varieties of ground/studied showed little variation in oil content (49.2±2.01); among fatty acids, oleic (49.9±12.5) and linoleic acid (34.4±12.4) showed wider variation. Oleic and linoleic acids were found to have strong negative correlation.

/nut

A.A.

5.13 Aqueous process for pilot plant scale production of peanut protein concentrate, K.C.RHEE, C.M.CARTER and K.T.MATTIL, J. Fd Sci., 1973, 38(1), 126.

In the aqueous system the recovery of oil was critically influenced by grinding methods and conditions and washing of the recovered solids, thus reducing the oil content of the concentrate and increasing the oil recovery. Approximately 92% of the protein and 89% of the oil were recovered in theprotein concentrate and in respectively.

K.R

5.14 Nutritional and chemical studies of three processed soybean foods, M.SHEMER, L.S.WEI and E.G.PERKINS, J. Fd Sci., 1973, 38(1), 112.

The three methods ofprocessing followed were: Product A was prepared by soaking the beans overnight, blanching at 210°F for 20 min. blending and drum drying at 40 PSIG of steam. Product B was water-packed canned soybeans blanched at 210°F for 20 min and thermally processed in cans at 250°F for 60 min, then blended, frozen and freeze dried. Product C a mixture of soya and banana (1:1 solid basis) was prepared by the same method as Product A. Product B showed a considerable decrease in methionine, compared to Product A. Product A was superior to the thermally processed product (B) considering browing but was inferior considering nitrogen solubility index. Cost analysis of the three products showed their superiority over casein as protein source.

KAR

5.15 Quantitative determination of fat, protein and carbohydrates of soy products with infra-red attenuated total reflectance, J.M.WILSON, A.KRAMER and I.BEN-GERA, J. Fd Sci., 1973, 38(1), 14.

Correlations of 0.96 for fat and 0.94 for protein were achieved between the chemical analysis and the infra-red technique using the base line absorbance (A^1) calculation and 120 mesh samples at 40 lb. force.

KAR

5.16 Simulated meats from soy protein, S.J.COLE, Fd Technol. Aust., 1973, 25(8), 388.

Deals with protein isolation and concentration, production of textured protein and product formulation.

*5.17 Analysis of commercial soya additives in meat products, R.C.E.GUY, R.JAYARAM and C.J.WILLCOX, J.Sci. Fd Agric., 1973, 24(12), 1551.

For the estimation of the soya proteins, extraction of the proteins from the food products was carried out either in 8M-urea and 4%, 2-mercaptoethanol at 18 to 20°C for 16 hr (Method 1) or 10 M-urea and 4%, 2-mercaptoethanol at 100°C for 30 min. (Method 2). The proteins were separated by electrophoresis using a 0.06 M-Tris-glycine buffer, pH 8.6. Both the methods gave results on soya protein additives in beef burgers and sausages, meat pie fillings and canned meat loaf products.

KAR

5.18 Acylated steryl glucosides from soybean globulins: Isolation and characterisation, W.J.WOLF and B.W.THOMAS, Cereal Chem., 1973, 50(5), 580.

The dry solids extracted with soy proteins with alcohol were leached with hexane, and the portion soluble in hexane was chromatographed on an activated magnesium silicate column. Yields of acylated steryl glycosides were 0.06% of the weight of the protein. The acylated steryl glycosides were characterized by TLC hydrolysis to steryl glucosides, and analysis of fatty acids, sterols and glucose. Although the fatty acids included 26% linoleic and 2% linolenic acid, the intact acylated steryl glucosides were not oxidized by the Theorell preparation of soybean lipoxygenase.

AA

5.19 A review of flavor investigations associated with the soy products raw soybeans defatted flakes and flours and isolates, JOSEPH A. MAGA, J. agric. Fd Chem., 1973, 21(5), 864.

65 references.

5.20 Occurrence of lead in sesame pastes and factors responsible for it, S.YANNAI and A.HAAS, Cereal Chem., 1973, 50(5), 613.

Sesame paste was found to contain a relatively high concentration of lead (approximately 2.2 p.p.m.). Since storage in unlacquered cans, including additional short-term test at 35°C, did not result in increase over the initial level (found in paste from the same batch stored in polyethylene jars), the conclusion is that the above high figure is due not to migration of the metal present in the packaging material, but rather to an original high content in the oil-seeds, as found in samples from three countries.

AA

5.21 Low molecular weight carbohydrates from rapeseed (Brassica campestiis) meal, I.R.SIDDIQUI, P.J.WOOD and G.KHANZADA, J. Sci. Fd Agric., 1973, 24(11), 1127.

The percentage composition of the carbohydrates in the oligosaccharide fraction (48%) of the deionised 80% ethanol-soluble solids was: D-fructose, 1.52; D-glucose, 2.8; D-galactose, traces, myo-inositol, 0.31; sucrose, 22.6; galactinol, 0.39; raffinose, 3.23; stachyose, 19.21; digalactosyl-glycerol, 0.97 and digalactosyl inositol, traces.

KMR

5.22 Influence of genetically determined differences in glucosinolate content on the nutritional value of rapeseed meal, EGAN JOSEFSSON and LARS MUNCK, J. Sci. Fd Agric., 1973, 24(10),1285.

A glucosinolate content corresponding to more than 1 mg potential isothiocyanates and oxazoli-dinethiones per g of diet containing rapeseed meal derived from heat treated samples depressed the 11-day growth of mice as well as feed consumption and protein efficiency ratios. KAR

5.23 Gel chromatography of sunflower proteins, MOHAMMED A. S.BIR, FR.NK W.SOSULSKI and S.MUEL L.M.CKENZIE, J. agric. Fd Chem., 1973, 21(6), 988.

Fractions 1-5 of Commander, Majak and alley Sun-flower seeds contained 5, 49 and 9% of extracted meal proteins, when salt extractable proteins of sun-flower flour were assayed by gel chromatography. The sunflower proteins were similar in Mol.wt. to soybean protein fractions. Soybean contained higher amounts of lysine than sun-flower, although its methionine content was lower. Majak proteins had more lysine, but less methionine than other two varieties of sunflower. The major fraction had higher amounts of isoleucine, phenylalanine, threonine and non-essential amino acids, while fraction IV was rich in lysine in comparison with other fractions.

BSN

See also

Detection of almond oil with apricot oil, 6.21
Protein quality of rice polish and combinations with peanut flour; FPC and lysine, 17.24

6. OILS, FATS and WAXES

6.20 Aroma components of olive oil, ROBERT A.FLATH, R.T.MON M. FORREY and DANIEL M. GUADAGNI, J. agric.Fd Chem., 1973, 21(6), 948.

Seventy seven components were identified by solvent extraction, dry column chromatography and GC-MS examination of polar volatile components of olive oil.

BSN

6.21 Detection of adulteration of almond oil with apricot oil through determination of tocopherols, ERWIN GUTFINGER and ARIE SELA.N, J. agric. Fd Chem., 1973, 21(6), 1121.

The method involves separation of tocopherols from the unsaponiable matter present in the oil mixture by TLC, and subsequent estimation of d- and -tocopherols by either GC or colorimetry. By the method suggested, upto 50% apricot oil present in almond oil may be detected.

AA

See also

Effect of processing pH on the properties of peanut protein isolates and oil, 5.11
Fatty acids of Aspergillus ochraceus, 14.40
Fatty acids of peanut, 5.12
GLC determination of beta-asarone, a component of oil of calamus in flavors and beverages, 12.26
Plant proteins meeting protein and fat quality, 17.21

7. STARCH, SUGAR and CONFECTIONERY

7.6 Volatile retention during freeze drying of aqueous suspensions of cellulose and starch, JORGE CHIRIFE and MARCUS KAREL, J. agric. Fd Chem., 1973, 21(6), 937.

The variables affecting the retention level of 14C-labeled 2-propanal in freeze dried starch or cellulose suspension are the concentration of solids and initial concentration of alcohol. Cellulose has a lower degree of retention than starch probably because of the low mobility of the chains in the highly crystalline cellulose which reduces the capacity for retention of alcohol through inclusion.

BSN

See also

Degradation of barley and malt starch granule, 2.85
Hygroscopic properties of corn starch oligosaccharides, 2.83
Properties of starches from maturing wheat, 2.68
Starch-protein interface in wheat endosperm, 2.74
Texture improvement of fresh-pack dill pickle by addition of lactose and sucrose, 19.14

8. SPICES and CONDIMENTS

*8.8 Colour and carotenoid changes in heated paprika, T.V.Ramakrishnan and R.J.FRANCIS, J. Fd Sci., 1973, 38(1), 25.

Heating paprika at 125°C for 60 min produced an appreciable change in colour with a 23% loss in carotenoids and 300% increase in browning compounds. Heating in a nitrogen atmosphere did not change the data whereas addition of lysine and galactose produced darker samples without affecting the carotenoid content. The colour changes can be predicted as Hunter 9 X L, values from either fristimulus or absorbance data.

KAR

9.41 Cadmium, lead and mercury content of various cured meats, D.C.KIRKPATRICK and D.E.COFFIN, J.Sci. Fd Agric., 1973, 24(12), 1595.

The results obtained from 190 cured meat samples showed the content for cadmium in the range < 0.01 to 0.22 part/million, the mean being 0.02 ppm; the range and mean of the lead content were < 0.01 to 0.42 and 0.05 ppm; the range and mean of the mercury content were 0.001 to 0.059 and 0.006 ppm.

MA

9.42 Possible substitutes for nitrite for pigment formation in cured meat products, ARLENE HOWARD, PATRICIA DUFFY, KATHY ELSE and W.DAANEBROWN, J. agric. Fd Chem., 1973, 21(5), 894.

Various concentrations of 24 nitrogenous ligands were examined for their ability to form ferrohemochromes with bovine myoglobin at pH 5.0 or 6.0. Methyl and hexyl nicotinate and N,N-diethylnicotinamide were particularly effective. Methyl and hexyl nicotinate and N,N-diethylnicotinamide produced stable pink pigments in cooked ground meat mixtures. These compounds were effective, as was trigonelline, in combination with 10 or 20 ppm nitrite in forming a stable and long-lasting pink cured meat colour in such systems.

MA

9.43 Collaborative study of a modified AOAC method and other rapid moisture methods for analysis of meat and meat products, J.D.PETTINATI, VIRGINIA G.METZGER, D.V.HORN and E.H.COHEN, J. Ass. off. anal. Chem., 1973, 56(5), 1130.

Moisture content in ground beef, frankfurters and fresh pork sausages was determined by 3 methods. One of them used a gravity oven at 125°C instead of a mechanical convection method. The other consisted in the exposure of sample to IR radiation for 40 min. The third method involved azeotropic distillation for 30 min. using xylene, cumene or octanal. The results from the first 2 methods agreed with those of official methods. The standard deviation for the 3 types of meat products averaged ± 0.65%.

JVS.

9.44 Collaborative study of rapid fat determination in meat and meat products by modification of the AOAC method, JULIO D.PETTINATI, CLIFTON F.SWIFT AND E.H. COHEN, J. Ass. off.anal.chem., 1973, 56(5), 1140

A 3-4 g, sample ground beef, frankfurters a pork sausage is dried in an extraction thimble at 125°C and extracted for 45 min. with ethyl ether; the fat

content is determined gravimetrically after completely removing solvent. The values agreed with those obtained by official methods. The standard deviation for the 3 types of meat products was ± 0.83% fat.

JVS

9.45 Collaborative study of a colorimetric method for determining arsenic residues in red meat and poultry, W.HARRON BUTTHILL, J.Ass.off.anal.Chem., 1973, 56(5), 1142.

The sample of liver or muscle is ashed with molybdenum nitrate and the ash is dissolved in dilute HCl; the Zn is added to generate AsH_3, which is trapped in iodine solution in a cuvet. The absorbance of color developed is read at 840 nm. The recoveries for 0.28 - 2.41 ppm As were 87.6-109.3%.

JVS

9.46 Effect of pre-slaughter injections of papain on toughness in lamb muscles induced by rapid chilling, D.N. RHODES and E.DRANSFIELD, J. Sci. Fd Agric., 1973, 24(12), 1583.

The toughening of lamb meat induced by rapid chilling was found to be prevented in carcasses given a pre-slaughter injection of papain solution at the normal commercial dose level. Increased dose levels produced more tender meat.

AA

9.47 Preparation and properties of low temperature extracted animal protein concentrate, R.T.TOLEDO, J. Fd Sci., 1973, 38(1), 141.

Protein concentrate prepared by extraction of fish deboned poultry by-products, pork back fat, and beef scraps with isopropyl alcohol (IPA) had good functional properties when the extraction was carried out at 45°C and below. When added to meat batters the protein concentrate showed the capacity to add to the water and fat binding capacity of the system. More solvent was required at higher fat content levels, an increase in the moisture content resulted in an increase in the solvent requirement.

KAR

9.48 The rate and mechanism of long chain 2,3-Dialkyl Acroleins formation in meat by heat treatment, TAKEO MAKIHSHI and KYOZOSUYAMA, Agric. biol. Chem., 1973, 37(6), 1341.

The long chain (C24 ~ C36) 2,3-dialkyl acroleins in heated meat were produced by aldol condensation and dehydration reaction of fatty aldehydes by

hydrolysis of plasmalogen. The reaction rate-data indicated that it appeared to be reasonable to assume the following complex reaction including consecutive and competitive reaction mechanism as an over-all picture of the reaction. However, at higher temperatures the reaction was found to be more complex than at lower temperatures.

Plasmalogen-aldehyde $\xrightarrow{K_1}$ Free fatty acid aldehyde
Free fatty acid aldehyde $\xrightarrow{K_2}$ 2,3-Dialkyl acrolein
Free fatty aldehyde $\xrightarrow{K_3}$ unidentified compounds

The apparent energy and entropy of activation for long chain 2,3-dialkyl acrolein formation were calculated to be 10.1 Kcal/mole and -49.8 cal/deg. mole respectively.

MA

9.49 Surface ultrastructure and tensile properties of cathepsin and collagenase treated muscle fibers, M.F.EINO and D.W.STANLEY, J. Fd Sci., 1973, 38(1), 51.

Cathepsins considerably accelerated decreases in tensile properties, collagenase showed similar results for breaking strength but break elongation was only slightly influenced. Cathepsin produced multiple breakage with extensive disruption and similar to those observed in naturally aged meat.

KAR

9.50 Absorption of water vapor on myosin A and myosin B, JOHN E.WALKER,JR, MAXWOLF and JOHN G.KAPSALIS, J.agric. Fd Chem., 1973, 21(5), 878.

The moisture sorption isotherms of myosin A and Myosin B were measured at 7°. The Bradley isotherm equation could be applied to the experimental water sorption behaviour of both proteins upto a water activity of 0.8. Residual potassium chloride bound to the protein affects the isotherm in all regions.

MA

9.51 Increasing the tenderness of bullock beef by use of antimortem enzyme injection, G.C.SMITH, R.L.WEST, R.H.REA AND Z.L.CARPENTER, J. Fd Sci., 1973, 38(1),182.

Antimortem injections of papain increased tenderness reduced the variability in tenderness among steaks from bullock carcasses. Such treatment could be used to more effectively merchandise beef from young bulls.

KAR

.52 A prolonged pr -rigor condition in aerobic surfaces o ox muscle, N.GARRY LEET and RONALD H.LOCKER, J. Sci. Fd Agric., 1973, 24(10), 1181.

Th aerobic surface of ox muscle remains in a pr -rigor condition for a month, if microbial growth is inhibited. Thaw shortening and surface pH were the principal criteria. The tissue also shortened in response to chilling or heating, but not to high voltage. At 15°C with free access of air the survival of surface layers of large pieces is limited; at 2°C and 8°C, thin strips survive for long periods.

KAR

.53 Changes in the low molecular weight nitrogenous compounds excised bovine muscle, H.J.PETROPAKIS, A.F.ANGLEMIER and M.W.MONTGOMERY, J. Fd Sci., 1973, 38(1), 59.

No differences were noted between the electrophoretic patterns of the soluble proteins of the 0- and 12-day samples either before or after gel filtration. The 12-day sample however contained a slightly higher level of low molecular weight non-protein nitrogen compounds.

KAR

9.54 Relationship of penetrometer readings on raw beef with cooked tenderness, DENE G.GALLOWAY, JUSTIN M.THOMY and LARRY C.HINNERGARDT, J. agric. Fd Chem., 1973, 21(5),860.

Simple linear correlation co-efficients between the maximum penetration force in the raw meat and technological taste panel evaluations were -0.84 and -0.78. Simple linear correlation co-efficients between water holding capacity, fat and moisture vs the technological taste panel evaluation for tenderness were -0.59, 0.32, and 0.36, respectively. The results of multiple correlation analysis using water holding capacity, protein, moisture, fat and ash were borderline when coupled with the maximum raw penetration force in improving the relationship of the maximum penetration force of raw meat to the technological taste panel evaluation.

AA

9.55 Isolation and identification of some sulfur chemicals present in pressure cooked beef, RICHARD A.WILSON, CYNTHIA J.MUSSINAN, IRA KATZ and ANNE SANDERSON, J.agric. Fd Chem., 1973, 21(5), 873.

Lean ground beef was slurried with water and cooked in a sealed stainless steel vessel at 163 and 182°. Atmospheric distillation, followed by, in the case of lower temperature product, continuous counter current ether extraction or for the 182° material, salt saturation and continuous liquid-liquid ether extraction, yielded extracts, which after concentration, were analysed by gas liquid chromatography (Glc) and Glc coupled with mass spectrometry. Forty six sulfur compounds were identified.

AA

9.56 Isolation and identification of pyrazines present in pressure cooked beef, CYNTHIA J.MUSSINAN, RICHARD A.WILSON and IRA KATZ, J.agric.Fd chem., 1973,21(5),870.

Flavor concentrates were isolated from beef cooked superatmospherically at 162.7° by simultaneous steam distillation and continuous solvent extraction. Separation and identification were accomplished by gc and coupled gc-mc. Mass spectral identifications were confirmed by IE values. 33 pyrazines were identified.

AA

9.57 The effect of repeated freeze-thaw cycles on tenderness and cooking loss in beef, R.H.LOCKER and G.J.DAINES, J. Sci. Fd Agric., 1973, 24(10), 1273.

The increase in tenderness was significant only when the muscle was taken in aggregate after two or three cycles of freezing and thawing. Cooking losses rose steeply after freezing once. Ageing did not affect cooking loss.

KAR

9.58 Heat induced changes in extractability of beef muscle collagen, P.C.PAUL, S.E.MC CRAE and T.M.HOFFBRAUER, J. Fd Sci., 1973, 38(1), 66.

Amount of soluble collagen increased with increasing internal temperature (58 to 82°C). The changes in the contractile fibers influenced texture more than did the changes in the collagen of these muscles under these heating conditions.

KAR

9.59 Influence of ante-morten glycolysis and dephosphorylation of high energy phosphates on beef ageing and tenderness, A.W.KHAN and C.P.LENTZ, J. Fd Sci., 1973,38(1) 56.

In muscle which had low-post slaughter pH, dephosphorylation of high energy phosphates and pH changes were complete in about 15 hr post-morten as against 32 hr taken by high-post slaughter pH muscles. Muscles with high post slaughter pH took 7 days of ageing to attain maximum tenderness.

KAR

9.60 Preparation of aqueous beef flavor precursor concentrate by selective ultrafiltration, AHMED F.MABROUK, J.agric. Fd Chem., 1973, 21(6), 942.

Aqueous beef extract was fractionated by two ultrafiltration systems, batch type and recirculating thin channel, equipped with two membranes of different retentive capacities. Ultrafiltration was achieved i

2.5-10% of the time needed for exhaustive conventional dialysis. Gel permeation chromatograms of beef flavor, precursors prepared by conventional dialysis and ultrafiltration show a high degree of similarity beyond the void volume fraction. The three preparations exhibited the same beef flavor and odor notes.

AA

.61 Isolation of salmonellae from pork carcasses, J.A. CARPENTER, J.G.ELLIOTT and T.E.REYNOLDS, Appl.Microbiol., 1973, 25(5), 731.

Four hundred and twenty pork carcasses from four abbatoirs were examined for presence of salmonellae by use of swabbing enrichment techniques and contact plate-methods. Carcasses from only one abbatoir were found to be contaminated by swabbing enrichment (23.3%) and contact plate (17.9%) methods. The area of the skin side of the ham near the anal opening was determined to be the area to examine for isolating salmonellae from pork carcasses with greatest frequency. The most frequently isolated species of salmonellae are S.derby. S.anatum, S.typhimirium and S.Indiana.

AA

.62 Influence of bacteria on the carbonyl compounds of ground porcine muscle, R.J.BOTHAST, R.F.KELLY AND P.P.GRAHAM, J. Fd Sci., 1973, 38(1), 75.

Individual monocarbonyl compounds were identified by thin-layer and gas liquid chromatography - Micrococcus cryophilus, Pseudomonas fluorescens, and Staphylococcus aureus decreased total carbonyls by 57, 18 and 43% respectively and total monocarbonyls by 55, 20 and 33% respectively. Pediococcus cerevisiae increased the total carbonyl and total monocarbonyl content by 70 and 71%. Methyl ketones, saturated aldehydes, 2-enals and 2,4-dienols were decreased by M.cryophilus, Ps fluorescens and S.aureus but each monocarbonyl class was increased by P.cerevisiae.

AA

.63 Potential precursors of N-Nitrosopyrrolidine in bacon and other fried foods, DONALD D.BLISS, KJELL I.HILDRUM, RICHARD A.SCANLAN and LEONARD M.LIBBEY, J.agric. Fd Chem., 1973, 21(5), 876.

N-Nitrosopyrrolidine was produced from N-nitro soproline, pyrrolidine, spermidine, proline and putrescine in yields of 2.6, 1.0, 1.0, 0.4 and 0.04% theoretical, respectively.

AA

9.64 Effects of water and microwave energy precooking on microbiological quality of chicken parts, T.C.CHEN, J.T. CULOTTA and W.S.WANG, J.Fd Sci., 1973, 38(1), 155.

Hot water pre-cooked chicken parts were consistently lower in bacterial count than the micro-wave energy cooked samples. Micrococcus or the genus Staphylococcus were the surviving organisms in the hot water cooked samples. Pre-cooking chicken in 3% polyphosphates solution resulted in an almost sterile product.

KAR

9.65 Acid hydrolysis of chicken muscle protein by reflex and sealed tube methods, M.S.OTTERBURN and W.J.SINCLAIR, J.Sci.Fd Agric., 1973, 24(8), 929.

A comparison has been made of the acid hydrolysis of dry, defatted chicken muscle protein by open reflex and sealed tube methods. It was found necessary to agitate the sealed tube hydrolysate vigorously in order to remove all traces of peptide material and attain satisfactory hydrolysis.

AA

9.66 Thermal conductivity of chicken meat at temperatures between -75 and 20°C, W.E.SWEAT C.G.HAUGH and W.J. STADELMAN, J.Fd Sci., 1973, 38(1), 158.

Time post-mortem had no significant effect on the thermal conductivity. The effect of temperature (measured at 20, 10, 0, -10, -20, -40 and -75°C) was similar to that reported in the literature. The following equations were suggested for use to express the results obtained for the white meat: K(Watt/m-°C)= 0.476+0.00060T(°C)(0-20°) and K(Watt/m-°C)=1.07 -.0149T-1.04 x 10^{-4} T^2 (-75 to -10°C).

KAR

9.67 Stability and acceptability of phosphate treated and pre-cooked chicken pieces reheated with microwave energy, L.E.DAWSON and E.C.SISON, J.Fd Sci., 1973, 38(1), 161.

Chicken pieces with and without sodium polyphosphate marination and precooked using microwave energy and steam followed by breading and browning were compared with those breaded and browned in corn oil under pressure. Pre-storage chicken was more acceptable than that held 3 months under fluctuating temperatures. Phosphate treated fresh chicken was more juicy and tender than controls.

KAR

9.68 Contamination of blood system and edible parts of poultry with Clostridium perfringens during water scalding, H.S.Lillard, J.Fd Sci., 1973, 38(1), 151.

Hearts and livers become contaminated during scalding. Scald water and its concomitant contaminants enter the body cavity, circulatory, digestive as well as the respiratory systems of water scalded broilers. Contaminants of the circulatory system are carried to edible parts also.

KAR

9.69 Colorimetric characterization of egg yolk and egg yolk products, S.T.MC CREADY, J.L.FRY, C.F.HINTON, and R.H.HAMMS J.Fd Sci., 1973, 38(1), 175.

Procedures are suggested for colour-Eye evaluation of various yolk forms and products. Characteristics of the aged yolk were reduced wavelength(λ d) and excitation purity (Pe) and an increase in luminous reflectance (Y CIE). Luminous reflectance values were substantially lowered by the addition of sugar and subsequent frozen storage. Yolk age effects were negligible for the colorimetric characterisation of yolks incorporated into product forms.

KAR

9.70 Determining microbial quality of liquid eggs using a filtrate release test, J.A.FILPPI and G.J.BANWART, J. Fd Sci., 1973, 38(1), 133.

Aseptically broken shell eggs were inoculated with Proteus mirabilis, Pseudomonas fragi and Streptococcus faecalis and incubated at room temperature. As the bacterial numbers increased, an increase in filtrate volume was observed where counts exceeded 10^7 organisms per milliliter. At this level of counts no off odour was noticeable.

KAR

.71 Identification of gangliosides as constituents of egg yolk, T.W.KEENAN and L.BERRIDGE, J. Fd Sci., 1973, 38(1), 43.

Approximately 0.07 m/u mole of ganglioside sialic acid was recovered per gram wet weight of yolk, glucose, galactose, hexosamine and sialic acid, in the molar proportions of 1.00 to 1.25 to 1.50 to 1.19, were the major carbohydrates of yolk ganglioside fractions. Fourteen fatty acids were observed in the ganglioside fraction: 16:0(26.6%), 18:0(9.2%), 18.1(22.9%) and 22:0 (28.3%) were predominant.

9.72 Separation and analysis of organic-bound and inorganic arsenic in marine organisms, G.LUNDE, J. Sci. Fd Agric., 1973, 24(9), 1021.

The method of separation is based on volatilisation of inorganic arsenic as arsenic trichloride by addition of hydrochloric acid and subsequent removal by distillation. Remaining arsenic is found as arseno-organic compounds that are stable under these conditions. Determination of arsenic was performed by neutrons activation and X-ray fluorescence.

KAR

9.73 A multiple sampling technique for use with the cell fragility method of determining deteriorative changes in frozen fish, K.J.WHITTLE, J.Sci.Fd Agric., 1973, 24(11) 1383.

A simple sampling method for the cell fragility technique which permits an almost ten fold increase in the number of determinations per hour. About 250 fish can be sampled per hour.

AA

9.74 Dynamic sanitation in the fish and seafood industry. R.R.PEDRAJA, Fd Technol.Champaign. 1973, 27(10),42.

The success of a sound sanitation and quality assurance program depends on the cooperation of all concerned with food production.

JVS

9.75 Preparation and properties of succinylated fish myofibrillar protein, HERMAN S.GRONINGER,JR, J.agric. Fd Chem., 1973, 21(6), 978.

Fish myofibrillar protein was reacted with succinic anhydride at 0° and a pH of 7.5 - 8.5 to form succinylated myofibrillar protein. This modified protein had the following dispersion properties: moderately rapid rehydration to form viscous aqueous dispersions that have a slightly opaque to water-like appearance; heat, stability, as shown by the absence of coagulation or precipitation during heating at 100°; relatively good dispersion in the pH range of 6.0 - 8.5; (however the presence of NaCl significantly lowered the viscosity); relatively high emulsification capacity as indicated by tests using a model system; and a relatively bland odor and flavor. The dried protein was organoleptically stable when stored at ambient temperature and with no special precautions to protect it from atmospheric oxygen and light. It was demonstrated that myofibrillar protein could be succinylated at various levels and that this degree of succinylation was related to functional property, such as emulsification capacity. The protein efficiency ratio for succinylated protein was somewhat lower than that of unsuccinylated fish protein.

AA

9.76 A deodorant for use in fish processing establishments, T.S.GOPALAKRISHNA IYER, Res & Ind., 1973, 12(1),23.

Describes the composition and method of preparation of deodorant based on pine oil. The deodorant with a mild disinfectant action may be produced at a cost of Rs. 0.40/litre.

BSN

9.77 Dibutyl and Di-(2-ethylhexyl) phthalate in fish, DAVID T.WILLIAMS, J.Agric. Fd Chem., 1973, 21(6),1128.

Low levels(0-78 ppb and 0.160 ppb) of dibutyl phthalate and diphthalate respectively were present in 21 samples of Canadian fish analysed.

BSN

9.78 Reduction in mercury content of fish protein concentrate by enzymatic digestion, MICHAEL C.ARCHER, BRUCE R.STILLINGS, STEVEN R. TAUNENBAUM and DANIEL I.C.WANG, J.Agric.Fd Chem., 1973, 21(6),1116.

A two- to seven fold concentration of mercury in the insoluble FPC fraction and a corresponding reduction of mercury level in the FPC fraction was achieved after proteolysis.

BSN

9.79 Fish protein concentrate as an emulsifier, B.M.KORSHGEN and R.E.BALDWIN, J. Fd Sci., 1973, 38(1), 179.

Fish protein concentrate (10% solubilized) adjusted to either pH 6 or 8 favoured firmness and fineness and stability of emulsions. Regardless of pH, the emulsions made with 20 g of solubilized 10% FPC were significantly more stable than those made with 10 or with 30 g.

K.R

9.80 Physical aspects of drying of fish meals, OLE MYKLESTAD, J.Sci.Fd Agric., 1973, 24(10), 1209.

Drying of meals of capelin, herring and mackerel indicated that the dehydration proceeded at falling rates, and was significantly affected by air temperature at all stages and by air velocity at the initial stages of the process. At higher temperature dehydration could be characterised by two time constants, one being twice as long as the other. Herring meal appeared to be more prone to structural changes than the other meals.

AA

9.81 Analysis of trace elements phosphorus and sulphur in the lipid and non-lipid phase of Halibut(Hippoglossus hippoglossus) and tunny(Thunnus thynnus),G.LUNDE, J. Sci. Fd Agric., 1973, 24(9), 1029.

Following elements were found in the lipid phase of halibut and tunny: arsenic, bromine, calcium, zinc, iron, phosphorus and sulphur and in the non-lipid phase: cadmium, lead, copper, selenium, zinc, iron, arsenic, mercury and sulphur. KAR

9.82 Textural changes in pre-cooked lobster(Homarus americanus) meat resulting from radurization followed by refrigerated storage, B.DAGBJARTSSON and M.SCHERG, J.Fd Sci., 1973, 38(1), 165.

Significant textural toughening resulted from irradiation with 100 krads whereas at 75 krads the changes were not significant. The texture did not change significantly during post irradiation storage at refrigeration temperatures. KAR

9.83 Evaluation of potential risk of botulism from seafood cocktails, PETER LEKK, Appl.Microbiol, 1973, 25(5),807.

Cl.botulinum F could not be detected in 35 samples of commercial sea food cocktails, ranging in pH from 4.10 - 4.85. At 30°C, toxinogenesis in homogenates pre-acidified with a citric-acetic acid mixture was prevented at pH 4.86 or lower for crab meat and at 5.03 or lower for shrimp. Measurements of the rate of acid penetration into the centres of large pieces of flesh indicated that the already small risk of botulism from seafood cocktails could be completely eliminated by using a cocktail sauce at a maximum pH of 3.70 and by cooling the final product to at least 10°C for 24 hr. AA

9.84 Shark fishery byproduct technology, F.MCLYNEUX, Fd Technol.Aust., 1973, 25(8), 398.

Includes edible composites, processing of shark fish for gelatin, shark meal and oil, edible fish protein concentrate and fish glues.

See also

Analysis of commercial soya additives in meat products, 5.17
Distribution and metabolism of aflatoxin B_1-14C in broiler chickens
Determination of chlorofenvinphos in milk, eggs, cattle and chicken tissues, 16.18
Protein quality of rice polish and combinations with peanut flour, FPC and lysine, 17.24
Simulated meats from soy protein, 5.16.

10 MILK & DAIRY PRODUCTS

Nil

See

GC determination of chlorofenvinphos in milk, eggs, cattle, and chicken tissues, 16.18
Nitrogen balances of adult humans fed blends of wheat, beans, corn, milk and rice, 17.18
Nutrine V (Maize, beans and milk blends) feeding to undernourished children, 17.23

11. COFFEE, TEA & COCOA

11.12 Determination of soluble solids in roasted coffee, P.H.VREE & J.A.YERANSIAN, J.Ass.off.anal.Chem., 1973, 56 (5), 1126.

The European Decaffination Association (EDA) method has been adopted as official first action. The sample is weighed (10 g), 200 ml of water added and weighed. The mixture is boiled for 5 min., cooled, reweighed and water added to bring the weight back to original. The mixture is filtered. The filtrate, (25 ml) is evaporated dried at 105°C and the residue weighed.

JVS

11.13 Influence of freeze-drying parameters on retention of flavour compounds of coffee, E.ETTRUP, PETERSEN, J.LORENTZEN & J.FIJNK, J.Fd Sci., 1973, 38 (1),119.

Volatile retention was greatest when slowly frozen samples were dried at low chamber pressure. Samples that were formed prior to slow freezing showed sizably reduced retentions slowly frozen samples showed gradually decreasing volatile retention as the pressure increased.

KAR

11.14 Biological and chemical factors affecting the valuation of North East Indian plains teas. III. Statistical evaluation of biochemical constituents and their effects on colour, brightness and strength of black teas, A.K.BISWAS, A.R. SARKAR & A.K.BISWAS, J.Sci.Fd Agric., 1973, 24 (12), 1457.

Regardless of tastes and methods of manufacture five biochemical factors, total oxygen uptake of unprocessed tea shoots and theaflavins (TF) thearubigins (TR), (-)-epigallocatechin gallate (EGCG) and theogallin(TG), of black tea are the main contributing factors of colour of North East India plains tea. Similarly three constituents TF, TR and (-)-epicatechin gallate (ECG) of black tea, are main factors for brightness. Four factors total oxygen uptake and EGC of unprocessed tea shoots and TF and moisture of black tea are the main contributing factors of strength of North East Indian plains tea.

AA

12. FOOD ADDITIVES

12.25 Saccharin: distribution and excretion of a limited dose in the rat, HAZEL B.MATHEWS; MINERVA FIELDS & LAWRENCE FISHBEIN, J.agric.Fd Chem., 1973, 21 (5), 916.

The administration of saccharin ^{14}C to male rats was designed to simulate the dose and conditions which might be used by humans. The dose (1 mg/kg) which represented 20% of the recommended safe dosewas found to be rapidly absorbed from the gastrointestinal tract; distributed throughout the body, and excreted primarily in the urine. The blood and tissue levels reached peak concentrations within 15 minutes after saccharin administration and decreased thereafter. The magnitudes of peak concentrations was dependent upon whether the animals had been fed or starved prior to saccharin administration. Saccharin was eliminated from most tissues, however, administration of multiple doses within a single day or over a period of several days resulted in accumulation of saccharin in some tissues, particularly the bladder. Removal of saccharin from the diet resulted in almost complete tissue clearance within 3 days.

AA

12.26 GLC determination of beta-asarone component of oil of calamus, in flavours and beverages, D.HARRY, J.Ass.off.anal.Chem., 1973, 56 (5), 1281.

The essential oil of *Acorus calamus* has been widely used as flavourings in liqueurs. The present method is used as flavourings in vermouths. Volatiles are isolated by steam distillation and separated

from other substances by solvent extraction and GLC. Quantitation was achieved by comparison of peaks with those of standards. Recoveries from vermouths spiked at 5 to 100 ppm averaged 98.8%.

JVS

See also

Determination of sorbitol in raisins and dietetic foods by GLC, 4.68
Estimation of malic and tartaric acids of grape juice, 4.69
Preservation of high-moisture dried prunes with sodium benzoate, 4.71
Sensory evaluation of high moisture dried prunes preserved with sodium benzoate, 4.70

13. FOOD ANALYSIS

3.11 Simplified spectrophotometric analysis of plants for selenium, O.E.OLSON, J.Ass.off.anal.Chem., 1973, 56 (5), 1073.

The method is based on light absorption at 378 nm of the piazselenol formed by the reaction of 2,3-diaminonapthalene with selenite. It was found to be suitable for samples having more than 2 ppm of selenium. Recoveries of Se added at 20 ppm level to soybean oil, corn, linseed oil meal and wheat bran were 98, 102, 96 and 95% respectively.

JVS

3.12 A method for obtaining reproducible quantitative gas chromatograms of volatiles isolated from foods, MICHAEL M.BLUMENTHAL & STEPHEN S.CHANG, J.agric. Fd Chem., 1973, 21 (1), 112.

Statistical interpretation of the gas chromatographic data obtained from volatile flavour compounds isolated from foods requires reproducible gas chromatograms. Injections of the volatiles isolated from frying oils into a high sensitivity gas chromatograph yielded similar but quantitatively different gas chromatograms in consecutive injections. It was found that after the gas chromatographic column has been saturated, with the volatiles by repeated injections, quantitatively as well qualitatively reproducible gas chromatograms can be obtained.

MM

13.13 Determination of organic acids in foods by liquid chromatography, J.MILS L.LAINE & D.LIETER M.LIST, J.agric.Fd Chem., 1973, 21 (5), 902.

About 15 acids occurring in common foods may be estimated in 75 minutes. These include: citric, isocitric, o(-ketoglutaric, succinic, fumaric, malic, oxalacetic, quinic, shikimic, acetic, galacturonic, lactic, malonic, oxalic and tartaric acids. 15-20 minutes will be needed to separate the predominant acids in an individual food sample. The acid peaks in the column are sharpened by a special precolumn injection system, which enables analysis of fruit juices and liquid foods or aqueous extracts of food samples without resorting to an elaborate pretreatment procedure. The quantitative measurements are simiplfied andcollection for confirmation studies of effluent samples are facilitated by using a differential refractometer detector.

AA

13.14 Analysis of organic acids in fruit products by anion exchange isolation and GC determination, D.W.BAKER, J.Ass.off.anal.Chem., 1973, 56 (5), 1197.

The method involves passing an alcoholic extract of fruit product through cation exchange resin column and then through an anion exchange column. Neutral fruit components are washed from the columns with alcohol and acetone solutions. Acidic components trapped on an ion exchange column are eluted using 6N formic acid in acetone. An aliquot of the elute is evaporated to dryness after the addition of benzene to remove the excess formic acid as an azeotrope. The residue is allowed to react with bis(trimethylsilyl) trifluoroacetamide to form trimethyl silyl ethers-ester derivatives which are detected by GC on non-polar (OV-1) column. Good recoveries were obtained for some common organic acids (succinic fumaric, maleic, tartaric, trans-aconitic and citric acids) from fruit juice.

AA

13.15 Two improved methods for the determination of soluble carbohydrates, A.E.FLOOD & C.A. PRIESTLEY, J.Sci.Fd Agric., 1973, 24 (8), 945.

Modifications made to a periodate oxidation procedure originally described by Rappaport et al. (1937) and an improved ferricyanide method suited to the reducing sugars determination made possible the routine estimation of fructose, reducing sugar, sucrose and sugar alcohol in aliquots of the same extract.

AA

3.16 An investigation of hydrolytic techniques for the amino acid analysis of foodstuffs, M.G.DAVIES & ALAN J.THOMAS, J.Sci.Fd Agric., 1973, 24 (12), 1525.

Amino acids were determined after hydrolysis of the proteins with hydrochloric acid, sulphuric acid, perchloric acid, p-toluene sulphonic acid and sodium hydroxide. Addition of some cation exchange resin to acids catalysed the hydrolysis of some peptide bonds containing aspartic acid, threonine, serine, glutamic acid, valine and isoleucine. Hydrolysis with 6N-hydrochloric acid gave the largest yield of most amino acids in food proteins.

KAR

See also

Analysis of commercial soya additives in meat products, 5.17
Analysis of trace elements phosphorus and sulphur in the lipid and non-lipid phase of Halibut, 9.8
Analytical results and mechanisms of flour proteins during dough mixing, 2.66
Colorimetric method for determining arsenic residues in red meat and poultry, 9.45
Detection of adulteration of almond oil with apricot oil, 6.21
Determination of aflatoxins in mixed feeds, 15.39
Determination of dissolved CO_2 of beer, 14.46
Determination of fat, protein and carbohydrates of soy products, 5.15
Determination of sorbitol in raisins and dietetic foods by GLC, 4.68
Determination of standards for aflatoxin M1, 15.42
Determination of sucrose diacetate hexaisobutyrate in soft drinks, 4.51.
Determining microbial quality of liquid eggs using a filtrate release test, 2.70
Evaluation methods for estimation of aflatoxin M1 in milk 15.41
Extraction method for treated and untreated grain grits during brewing, 14.43
Fluorodensitometric determination of quinine in soft drinks, 4.50
Fluorometric determination of limonin in grape fruit and orange juice, 4.58
GC analysis of organochlorine pesticides, 16.14
GC determination of chlorfenvinphos in milk, eggs, cattle and chicken tissues, 16.18
Gel chromatography of sun flower proteins, 5.23
Gel consistency test for eating quality of rice, 2.51
Gel filtration and electrophoresis results of flour proteins during dough mixing, 2.65

GLC determination of beta asarone component of oil of calamus in flavours and beverages, 12.26
GLC determination of Dursban, 16.14
MH resudues estimation in tobacco and vegetables, 4.73
Micro determination of pyrethrins, 16.16
Multiple sampling technique for determining deteriorative changes in frozen fish, 9.73
Pit detection in cherries by IR, 4.72
Quantitative determination of chemical confirmation of sterigmatocystin in grains, 2.48
Rapid determination of fat in meat and meat products, 9.44
Rapid estimation of moisture in meat and meat products, 9.43
Separation and analysis of organic bound and inorganic arsenic in marine organisms, 9.72
Spectrophotometric determination of dehydroacetic acid in fruits and vegetables, 4.49
Thermo-analytical study of moisture in grain, 2.47
TLC of colour developer in pinking of white onion purees, 4.80

14. FOOD MICROBIOLOGY & FERMENTATION

14.[illegible] High temperature short time (HTST) processing of suspensions containing bacterial spores, R.A.JACOBS, L.L.KEMPE & N.A.MILONE, J.Fd Sci., 1973, 38 (1), 168.

The presence of particles inoculated with B.subtilis 5230 spore increased the time needed to sterilize the broth and this is evident where paper rolls were used.

KAR

14.33 Instability of sodium nitrite in a chemically definied microbiological medium, W.E.RIHA & M.SOLBERG, J.Fd Sci., 1973, 38 (1), 1.

Heating mixtures of sodium nitrite, amino acids and ascorbic acid at pH 6.3 or 7.2 for 15 min at 121°C reduced the nitrite concentration by 30-50% whereas/of filter sterilised medium at 43°C for storage 18-24 hr resulted in 50-65% loss of nitrite while in heat sterilized medium it was 90%. None of the 19 amino acids stored individually with sodium nitrite affected the nitrite concentration, whereas ascorbic acid resulted in total disappearance of the nitrite.

KAR

4.34 (-) -3^t, 4^t - Dihydroxycyclohexane -1^c-carboxylate, a new quinate metabolite of Lactobacillus plantarum
E.C.WHITING & D. J. COGGINS, J.Sci.Fd Agric., 1973, 24 (8), 897.

Luctobacillus plantarum, isolate No 13a, reduces (-) - quinate, shikimate and (-) -dihydroshikimate to a new metabolite identified as (-) -3^t, 4^t dihydroxycyclohexane 1^c - carboxylate. The absolute stereochemistry of the product is given and is shown to resemble that of (-) quinic and (-) -dihydroshikimic acids.

AA

4.35 Investigations of some volatile constituents of mushrooms (Agaricus bisporus): changes which occur during heating, SHIRLEY M.PICARDI & PHILIP ISSENBERG, J.agric.Fd Chem., 1973, 21 (6), 959.

1-octen-3 one was detected in cooked mushrooms as a major volatile components in addition to following volatile components present in raw mushrooms: 3-octanone, 3-octanol, 1-octen-3-ol, benzaldehyde, octanol, and 2-octen-1-ol. 1-octen-3-one was formed in detectable amounts only after boiling mushrooms for about 15 min.

BSN

4.36 An analysis of the flavour of the dried mushrooms, Boletus edulis, ALAN F.THOMAS, J.agric.Fd Chem., 1973, 21 (6), 955.

Dried mushroom (Boletus edulis) extract when subjected to coupled GC and MS analysis yielded 70 flavour components, which included nine pyrazines and seven 2-formylpyroles.

BSN

4.37 Storage of mushrooms in pre-packs: the effect of changes in carbon dioxide and oxygen on quantity, ROYSTON NICHOLAS & J.B.W.HAMMOND, J.Sci.Fd Agric., 1973, 24 (11), 1371.

Mushrooms were picked at the 'button' stage and stored at 4 or 10°C in styrene punnets (pre-packs) over wrapped with one of a range of plastic films for 3 to 5 days. As a result of respiration, the internal atmosphere of the pre-pack was rapidly modified until after about 24 hr a rough equilibrium concentration of CO_2 and O_2 was established. At 18°C the gas changes inside the pre-packs prevented opening of the pileus and in combination with prevention of water loss by the film, slowed down deterioration of the mushrooms. CO_2 concentrations above or below 10 to 12% were associated with increased browning. At 2°C overwrapping generally caused slight external browning of the pileus.

KAR

14.38 Functionality of yeast protein dried at two temperatures, T.P.LABUZA & K.A.JONES, J.Fd Sci., 1973, 38 (1), 177.

Yeast dried at 124°C exhibited much better functional properties still was not as good as milk solids. Cell wall removal was not neededfor SCP manufacture.

KAR

14.39 Studies on debranching enzymes. 1. The limit dextrinase activity of extracts of certain higher plants and commercial plants, D.J.MANNERS & D.YELLOWLEES, J.Inst.Brew., 1973, 79 (5), 377.

The limit dextrinase activity of protein extracts of plant and commercial malts has been measured by using pullulan as the substrate. Extracts of ungerminated rye, barley, maize, and wheat showed low activity which increased on germination. Extracts of ungerminated oats had high activity. Commercial malts showed varying levels of limit dextrinase activity which was not related to diastatic power.

JVS

14.40 The component fatty acids of Aspergillus ochraceus fat, MADAN GOPAL SOOD & JAGJIT SINGH, J.Sci.Fd Agric., 1973, 24 (10), 1171.

Aspergillus ochraceus, grown on a surface culture in a chemically defined medium of sucrose and inorganic salts, gave a high yield of fat (47.5%), the main component acids of which were myristic (0.2%); palmitic (37.6%); stearic (0.1%); oleic (14.6%); linoleic (45.3%); and linolenic (2.2%).

AA

14.41 The genus Zymononas - a review. M.J.S.DADDS & P.A.MARTIN , J.Inst.Brew., 1973, 79 (5), 386.

Occurrence, detection and control of organism in the fermentation industry. 51 references.

JVS

14.42 The impact of science and technology on wine making, B.C.RANKINE, Fd Technol.Aust., 1973, 25 (10), 488.

Review deals with refrigeration and controlled fermentation, prevention of oxidation with inert gas, grape crushing and processing equipment, new white and red wine making process, sparkling wine, selected yeast cultures, centrifugation, ion exchange, malo-lactic fermentation, micro-biological control, laboratory quality control flavoured wine, bottling and warehousing operations, and the new developments.

14.43 The Institute of Brewing Analysis Committee, extract of untreated grain grits and other raw grain; A.L.WHITBEAR, J.Inst.Brew., 1973, 79 (5), 416.

A half and half method of determining the potential extract of untreated grits and raw grain is recommended; if replaces the cold water extract method.

MA

14.44 The staling of beer, J.STRAINE & P.VAN HERDE, J.Inst.Brew., 1973, 79 (5), 414.

Evidence has been presented to show that products of carotenoids may also contribute to stale flavour.

JVS

14.45 Internal carbohydrates of Saccharomyces carlsbergensis during commercial lager brewing, C.B.PATEL & W.F. INGLEDEW, J.Inst.Brew., 1973, 79 (5), 392.

The nitrogen of the wort became limiting during the commercial brewing of lager and the internal carbohydrates of the yeast showed variations in their levels; mannans and alkali soluble glycogen in yeast did not fluctuate much but trechalose, glucans and acid soluble glycogen increased after nitrogen limitation.

JVS

14.46 A rapid mano-metric/volumetric method for the determination of dissolved CO_2 content of beer in tanks, B.T.HEARD, J.Inst.Brew., 1973, 79 (5), 371.

The method is useful for use even by unskilled operators in breweries. CO_2 is withdrawn from solution under reduced pressure and measured by volume. Manometric principles are used to calculate

CO_2 left in solution after this extraction and by the addition of these 2 fractions, the total dissolved CO_2 of the beer is obtained.

JVS

14.47 The selective extraction of aroma components from alcoholic distillates, A.A.WILLIAMS & O.C.DUCKETT, J.Sci.Fd Agric., 1973, 24 (8), 863.

Separating funnel extractions of ethanolic solutions of esters and alcohols using pentane showed preferential removal of esters; trichloromethane was less selective. The amounts of both alcohols and esters extracted by an equal volume of pentane decreased with increase in ethanol concentration this decrease is more marked for alcohols. The selective nature of pentane was lost in the process of increasing efficiency.

KAR

14.48 Factors affecting wort separation
J.BARRETT, J.F.CHAPPERTON, D.M.DIVERS & H.RAMMIE, J.Inst.Brew., 1973, 79 (5), 407.

Particle size of grist had a major effect on the separation of wort. Fine particles which impede the flow can pre-exist in the grist and form an impermeable matrix. Large sized particles do not prevent run-off of wort. Beta glucans also hindered separation of wort.

JVS

See also

Colorimetric characterization of egg yolk and egg yolk products, 9.69
Contamination of poultry blood and edible parts with Cl.perfringens 9.68
Determining microbial quality of liquid eggs using a filterate release test, 9.70
Determination of soluble solids in roasted coffee, 11.12
Dynamic sanitation in fish and sea foods industry, 9.74
Effect of water and microwave energy precooking on microbiological quality, 9.64
Influence of bacteria on carbonyl compounds of ground porcine muscles, 9.62
Influence of packaging materials on microbial growth, 18.19
Nutritive value of processed S.cerevisiae, Scenedesmus, Chlicus and Spirulana platensis as assessed by rat growth, 17.25
Preservation of carrots by lactic acid fermentation, 1.76

Prolonged preregor conditions in aerobic surfaces of oxmuscle, 9.52
Suppression of fungal growth of isolated trypsin inhibitors of corn, 2.80

15. TOXICOLOGY

15.39 Determination of aflatoxins in mixed feeds, [illegible], J.Ass.off.anal.Chem., 1973, 56 (5), 1111.

Steps of extraction, purification, and clean-up are described for aflatoxin in feeds. TLC is used for quantitative estimation; sensitivity of 2-4 ppb was possible during analysis of dairy, hog, horse, trout and broiler feeds.

JVS

15.40 Evaluation of response of Dugesia tigrina to aflatoxin B1, G.C.LLEWELLYN, J.Ass.off.anal.Chem., 1973, 56 (5), 1119.

Dugesia tigrina maintained in doses of toxin varying from 3.125 mcg/ml to 0.312 mcg/ml showed 50% lethal response in 2 days to 15 days. Cut portions of head section showed greater lethal responses than tail sections. The head and tail portions of D.tigrina exposed to 0.312 and 0.156 mcg/ml levels of toxin showed regeneration in normal manner and did not show any gross pathological abnormalities in regenerated tissue.

JVS

15.41 Aflatoxin M1 in milk: an evaluation of methods, R.D.STUBBLEFIELD, C.A.L.[illegible] & O.D.[illegible] L. SHOTWELL, J.Ass.off.anal.Chem., 1973, 56 (5), 1106.

Six methods were compared for estimating aflatoxin M1 in liquid and powdered milk; two methods were found to be suitable. For the liquid milk, M1 is extracted with methanol-water (9 + 1) with simultaneous precipitation of milk protein. In the case of powdered milk M1 is extracted with acetone-water (70-30) and milk protein precipitated by lead acetate. The fat is removed by extraction with hexane in both methods and M1 is extracted with chloroform and determined by TLC.

JVS

15.42 Collaborative study of aflatoxin M1 standards.
IAIN F.H., PURCHASE & BRIAN STENKIRK,
J. Ass. off. anal. Chem., 1973, 56 (5), 1115.

Aflotoxin M1 standards dissolved in chloroform were superior to those in benzene - acetonitrile; storage for 4 months at -10°C did not show any measurable decreases in the concentration of M1. The fluorescence of aflatoxin M1 and G1 separated on silica gel plates was found to be nearly same by visual or densitrometric methods.

JVS

15.43 Bright greenish-yellow fluorescence and associated fungi in white corn naturally contaminated with aflatoxin, D.I.FENNELL, A.T.HOWARD, F.S.HILLMAN & R.E.PETERSON, Cereal Chem., 1973, 50 (4), 404.

Good correlation was observed between the presence of Aspergillus flavus Link ex.Fr., a bright greenish yellow (BGY) fluorescence and aflatoxin in a naturally contaminated white corn. However, A.flavus was observed on nonfluorescent whole undamaged kernels that assessayed at 30 ppb and on non-fluorescent whole damaged kernels and fragments that assayed at 3000 ppb whole damaged kernels that failed to fluxesce externally yielded some fluorosing fragments when coarsely ground. BGY influorescence in whole corn was observed on the face of the kernels immediately above the germ, and sectioned kernels the emission was generally restricted to a narrow region outlining the germ. Usually initial development of A.flavus was confined to the germ region. Isolates from A.flavus from aflatoxin contaminated corn could be separated into four groups on gross cultural characteristics. Two of four isolates selected as representative of these groups exhibited aflatoxin production capability, whereas all four synthesized [illegible] assumed precursor of BGY flourescence.

See also

Botulism from sea foods, 9.83
Cadmium, lead and mercury in cured meats, 9.41
Colorimetric method for determining arsenic residues in red meat and poultry, 9.45
Isolation of salmonellae from pork carcasses, 9.61 -
Lead in sesame pastes, 5.20
Separation and analysis of organic bound and inorganic arsenic in marine organisms, 9.72
Reduction in mercury content of fish by enzymatic digestion, 9.78

16. INFESTATION, PESTICIDES & FUNGICIDES

16.14 Element specific gas chromatographic analyses of organochlorine pesticides on the presence of PCB's by selective cancellation of interfering peaks, GEORGE C.C. SU & HAROLD A.PRICE, J.Assoc.Fd Chem., 1973, 21 (6), 1099.

Polychlorinated biphenyl interference-free qualitative and quantitative gas chromatographic analyses (GC) of /3-BHC, oxychlordane, heptachlorepoxide, p,p'-DDE, o,p-DDT,p-p'-DDD, p,p-DDT and Mirex in the 10-25 ng range have been carried out in the presence of approximately 10-20 times their concentrations of Aroclores 1232, 1248, 1254 and 1260 by the use of the Coulson electrolytic conductivity detector in the non-catalytic reductive mode. No modification of the detector system was necessary except to set the detector's reactor temperature at 660°. The results on individual analyses in most instances were within ± 20% of the actual value.

16.15 GLC determination of chloropyriphos in Dursban insectidide formulations, A.R.HANYS, BARBARA, S. ENGDAHL, & B.M.COLVIN, J.Ass.off.anal.Chem., 1973, 56 (5), 1093.

Chloropyriphos is extracted with chloroform from the formulation, and Dieldrin is added as internal standard. The extract is injected into a gas chromatograph and quantitated by using peak height ratios. A flame ionisation detector and a column packed with OV-17 + 2F-1 are used. The values obtained closely agree with those got from IR and colorimetric procedures.

JVS

16.16 A new colorimetric method for the micro determination of pyrethrins, H.M.BHARGAVA, S.M.AHMED AND R.N.VINDRAMAN GUPTA, Res. & Ind., 1973, 18 (1), 21.

A new colorimetric method for the microdetermination of pyrethrins in the presence of pyrogallic acid, an antioxidant and other adjuvants is described. Pyrethrins react with sulphuric acid to yield a colour complex, which has a maximum absorbance at 263 mu. Complete colour reaction requires heating for 10 min at 100°C. The colour complex is stable for a long period and Beer's law is obeyed in the range of 1-120 ug pyrethrins. Sufficient absorbance is obtained when sulphuric acid of 80-98% strength is used. Ethyl alcohol, ethyl acetate and trichloroethylene did

not interfere with colour reactions. Hexachlorocyclohexane, lindane and aldrin when incorporated with pyrethrins did not affect the colour complex. The method developed is specific and rapid. It is highly sensitive, enabling the estimation of pyrethrins at as low as 1 ug level.

16.17 Metabolism of lindane-^{14}C in the rabbit: Ether-soluble urinary metabolites, JAMES C.KRAPALLY, JADU G.SAHA & YOUNG W.LEE, J.agric.Fd Chem., 1973, 21 (5), 811.

Uniformly labeled lindane-^{14}C (2.04µc) in gelatin capsules was fed to five rabbits over a period of 26 weeks. By the end of the feeding period, 54% of the administered radioactivity had been excreted in the urine and 13% in the feces. About 56% of the urinary metabolites were soluble in ether. From the ether-soluble urinary metabolites 2,3,5-, 2,4,5-and 2,4,6-trichlorophenol and 2,3,4,6-tetrachlorophenol were identified by comparing infra red spectra of the isolated chlorophenols and/or their anisole derivatives with those of the reference compounds. Three other metabolites, 2,3- and 2,4-dichlorophenol and 2,3,4,5-tetrachlorophenol were identified by the GC retention times and their mass spectra. Seven more chlorophenols and six chlorobenzenes were tentatively identified which were: 2,5-, 2,6-and 3,4-dichlorophenol, 2,3,4-2,3,6-and 3,4,5-tetrachlorophenol, pentachlorophenol, 1,4-dichlorobenzene, 1,2,3,5-tetrachlorobenzene and pentachlorobenzene.

16.18 Gas-liquid chromatographic determination of chlorofenviphos in milk, eggs and body tissues of cattle and chickens, MARCELLUS C.IVLY, ALBERT D.OCHLER & HOUSTON V.CLARKEN, J.agric.Fd Chem., 1973, 21 (5), 822.

A GC equipped with a flame photometric detector provided a highly sensitive method of determining residues of chlorofenviphos in milk, eggs and body tissues of cattle and/0.002 ppm of the insecticide could be detected and eggs. Recoveries of 83-100% were obtained of the cattle and from fat muscle, liver, skin, and manure of chickens. Recoveries from milk and eggs were 93 and 81% respectively

/chickens. With the extraction and clean up in milk and 0.001 ppm in body tissues

16.19 Measurement of residues of dichlorvos absorbed by food exposed during disinfection of aircraft, WILLIAM E.DALE, JAMES W.MILES & DAVID B.MONTERS, J.agric.Fd Chem., 1973, 21 (5), 858.

Whole (complete) meals when exposed to 0.25g/ug/l of dichlorvos for 30 minutes, absorbed about 0.18 ppm. In beverages and margarine exposed for the same period, the residues were about 1/10 and three times as high as for whole meals. The method is sensitive upto 0.005 ppm of dichlorvos.

BSN

16.20 Metal coordination compounds of thiabendazole, VERNON L.MILLER, CHARLES J.GOULD, ELIZABETH C.SONKA & ROY L.JENSEN, J.agric.Fd Chem., 1973, 21 (5), 931.

Several metal coordination compounds of the fungicide thiabendazole, 2-(4'-thiazoyl) benzimadazole (TB2) have been prepared and the solubilities in water and the pH of the solutions have been determined. Fungicidal activity of the compounds = TB2 against an isolate of Penicillium and Fusarium.

AA

See also

Nitrate and nitrile content of market potatoes, 4.81
Phosphomidon residues in oranges, lemons and grape fruit, 4.56

17. NUTRITION & BIOCHEMISTRY

17.17 The limitations and dangers of commerciogenic nutriticus foods, BARRY M.POPKIN & MICHAEL C. LATHAM, Am.J.Clin.Nutr., 1973, 26 (9), 1015.

Review, 22 references.

17.18 Nitrogen balances of adult human subjects fed combinations of wheat, beans, corn, milk and rice, HELEN E.CLARK, JEAN L.MALZER, HELEN M.ONDERKA, JEAN M.HOWE & WANHE MOON, Am.J.Clin.Nutr., 1973, 26 (7), 702.

Six combinations of wheat flour, beans, corn, rice and milk were fed to healthy young adults. Wheat flour furnished 50% of the 7.0 g of nitrogen in the basal diet and two other sources each supplied 25%. Mean daily nitrogen balances, which ranged between 0.72 ± 0.38 did not differ significantly as a result of treatment. Urinary nitrogen was not influenced significantly by treatment, but fecal nitrogen tended to be higher when beans were included.

AA

17.19 Nitrogen balance in rats fed rices differing in protein content, B.O.EGGUM & B.O.JULIANO, J.Sci.Fd Agric., 1973, 24 (8), 921.

Nitrogen balance was studied in rats fed seven milled rice samples with 1.10 to 2.73% N dry basis. True digestibility (t.d.) of the protein ranged from 94.4 to 100.1% biological value (b.v.) ranged from 67.9 to 75.2% and net protein utilization (n.p.u) from 64.2 to 75.3%/and n.p.u. were positively correlated with lysine content of rice protein (3.17 to 4.07 g/16 gN). Utilisable N ranged from 0.83 to 1.81% and was mainly determined by N content of milled rice (r=0.988**). A sample of brown rice had lower t.d. but higher b.v. than the corresponding milled rice. Digestibility of amino acids of milled rice protein by faecal analysis ranged from 9-.1 to 100.0 to the samples with 1.38 and 2.74% N dry basis.

/T.d

AA

17.20 Digestive acceptability of proteins as measured by initial rate of in vitro proteolysis, J.A.FAGI, K.LORENZ AND O.ONAYEMI, J.Fd Sci., 1973, 38 (1), 173.

Sodium caseinate was found to be the most easily digestible protein source, isolated soy proteinate was the least digestible followed by FPC defatted cotton seed flour and peanut flour. Steaming resulted faster hydrolysis rates.

KAR

17.21 Plant proteins in relation to needs for protein and fat quality, ALBERT SANCHEZ, G.G.PORTER E.LEE & U.D.REGISTER, Indian J.Nutr.Dietet., 1973, 10 (5), 240.

Experiments with albino rats have shown that plant proteins as single food or in combination are comparable to animal proteins with regard to their protein and fat quality.

BSN

*17.22 Nutritional evaluation of the seed proteins of Calophyllum inophyllum Linn. and Bassia latifolia, N.VENKATESAN & D.V.RAGH, J.Sci.Fd Agric., 1973, 24 (11), 1317.

The methionine content of undi protein is very low (0.6g/16 gN) as compared to that of Mowra protein (1.6g/16 gN). Reasonably good correlation between chemical data and biological performance has been observed. The meal when made nutritionally adequate by supplementation is capable of supprting normal growth rate. Growth rates of animals receiving 50% of the protein is debittered mowra meal were however lower, but no pathological symptoms were noticeable.

AA

17.23 The testing of nutriene V, a plant protein mixture in the recuperation of undernourished children, ALVARO VIERA DE MELLO, NELSON CHAVES, MARIA ANUNCIADA FERRAZ DE LUCENA, RAMANITA MAYER VARELA, TEREZA COSTA, SUZANA FERREIRA GOMES TEIXEIRA, AUROHI COSTA SILZANO, GERALDO CARVALHO MARTINS & EMILIA ALENCAR MONTEIRO, Am.J.Clin.Nutr., 1973, 26 (9), 1024.

Nutrine V.(maize, beans and milk and supplemented with vitamin A and B complex) when fed to children was found to meet with 100% of the recommended dietary allowances except that 60% protein needs alone were met by nutrine V.

RSN

17.24 Protein quality of rice polish and combinations with peanut flour, fish protein concentrate and lysine, L.M.WAKEFIELD & R.ROWLANDS, Cereal Chem., 1973, 50 (4), 429.

Assessment of proteins by cumulative weight gain, PER, BV and digestibility coefficient indicated rice polish as the effective means of increasing BV and PER in animal feeding experiments. DC indicates possible use of rice polish as a source of protein in India's diet. Rice polish and a protein concentrate had highest BV in this study.

17.25 Nutritive value of processed Saccharomyces cerevisiae, Scenedesmus obliques and Spirulina platensis measured by protein synthesis in vitro in rat skeletal muscle, PER T.ÖSTEDT, ALEXANDRA VON DER DECKEN, GUDMUND HEDENSKOG & HASSAN MOGREN, J.Sci.Fd Agric., 1973, 24, 1103.

The nutritive value of lyophilised bakers yeast Saccharomyces cerevisiae increased after mechanical disintegration, further improvement was achieved by feeding yeast protein concentrates. The nutritional quality of yeast preparations was higher than that of wheat gluten but was lower than casein supplemented with methionine. Metabolic utilization of spray-dried microalga Scenedesmus obliquus increased after mechanical disintegration. Lyophilised Spirulina platensis had nutritional quality between that of wheat gluten and casein supplemented with methionine. Addition of methionine to air dried baker's yeast or drum dried Scenedosmus obliquus and Spirulina platensis stimulated the metabolic utilization of the micro-organisms.

K/R

17.26 Lysine supplementation of wheat gluten at adequate and restricted energy in young men, NEVIN SCRIMSHAW, Y.YONE TAYLOR & VERNON ROBERT YOUNG, Am.J.Clin.Nutr., 1973, 26 (9), 965.

At 2.25% of total protein intake, N balance was significantly improved by lysine supplementation to almost the same degree in both those subsisting on adequate and restricted levels of energy.

BSN

17.27 Manoic flour as a methionine carrier to balance common bean-based diets, J.L.DE OLIVEIRA, E.B.Z.M.SALATA & J.CAMPOS, Jr., J.Fd Sci., 1973, 38 (1), 116.

Results showed that the fortification of manoic flour with 0.2-0.4% methionine would improve the protein value of different manoic flour: beans mixtures. Undesirable effects of high amounts of methionine in the mixture were demonstrated, but these levels were higher than those expected to be consumed under normal conditions.

K/R

+17.28 Calories in the treatment of PCM (protein calorie malnutrition), PAUL GYORGY, RAJAMMAL P.DEVADAS & USHA CHANDRASEKHAR, Indian J.Nutr.Dietet., 1973, 10 (5), 250.

Review . 32 references.

17.29 Bedonin osteomalacia due to calcium deprivation caused by high phytic acid content of unleavened bread, G.M.BERYLENE, J.BEN AVI, M.D.E.NORD & R.SHAINKIN, Am.J.Clin.Nutr., 1973, 26 (9),910.

Osteomalacia in the Bedomin was found in one case to be associated with a high phytic acid intake (in the form of unleavened bread) and a low calcium intake (500 mg/day).

AA

+17.30 Availability to school children of iron from Amaranthus cooked in two different utensils, RAJAMMAL P.DEVADAS, USHA CHANDRASEKHAR & K.S. KUMARI, Indian J.Nutr.Dietet., 1973, 10 (5),223.

Children receiving school lunch with 37.5 g daily of amaranthus cooked in iron vessel for 7 months improved their heights, weights and haemoglobin levels in comparison with the control group.

BSN

17.31 Absorption of fortification iron in bread, JAMES D.COOK, VIRGINIA MINNICH, CARL V.MOORE, ARLETTE R.SMUSSEN, WILLIAM B.BRADLEY & CLEMENT A.FINCH, Am.J.Clin.Nutr., 1973, 26 (8), 861.

Absorption of sodium iron pyrophosphate was one-tenth and ferric orthophosphate one-third of ferrous sulphate when baked into the same roll or into separate rolls and administered simultaneously, whereas ferrous sulfate and iron reduced by hydrogen were about equally available. In 32 fasting supplemental iron as tagged ferrous sulfate, absorption averaged 5.7% and was roughly one-quarter of the absorption from the same dose of ferrous sulfate administered as a solution of inorganic iron. When rolls supplemented with 3 mg iron as tagged ferrous sulfate were taken with meals or with a regular diet, absorption averaged 6.3 and 2.1% from meals with and without meal protein, respectively. Studies with an extrinsic tag demonstrated that fortification iron in the form of ferrous sulfate underwent complete exchange with the non-heme pool of dietary iron.

AA

.32 Absorption of fortification iron by the rat : Comparison of type and level of iron incorporated into mixed grain cereal, J.[illegible]S & E.R.MONSEN, J.agric.Fd Chem., 1973, 21 (5), 813.

Iron was fed to rats at 20, 80 and 320 ug/500 of cereal. Ferrous sulphate was the most available supplement, followed by reduced iron. Ferric orthophosphate and sodium iron pyrophosphate were poorely absorbed.

See also

Absorption of water vapor by myosin A and B ,9.50
Acid hydrolysis of chicken muscles protein by reflux and sealed tube methods, 9.65
Acylated steryl glucosides from soybean globulins,5.18
Amino acid analysis of foods, employing hydrolytic techniques, 13.16
Amino acids of atta and other wheat products, 2.60
Aroma, flavours and fatty acids composition of [illegible]
Basic protein from bread wheat, 2.57
Beef aging and tenderness as influenced by glycolysis and dephosphorylation, 9.59
Biochemical basis of grain hardness in wheat, 2.53
Cadmium, lead and mercury in curdmeats, 9.41
Changes in chloroplast pigments during preparation of leaf protein, 4.78
Changes in ethylene and CO_2 during ripeningof apples,4.62
Changes in flour proteins during dough mixing,2.64, 2.65, 2.66
Changes in low molecular weight nitrogenous compounds of excised bovine muscle, 9.53
Colour and carotenoid changes in heated paprika,8.8
Composition of surface waxes of apple fruits and changes during storage, 4.63
Compositional variations in the bran layers of wheat,2.56
Condensed phosphatases for precipitation of protein from gluten washing effluent, 2.70
Corn germ protein isolate, 2.79
Degreening of Valencia oranges, 4.54
Determination of fat, protein and carbohydrates of soy products, 5.15
Distribution of ^{14}C ethylene and the incorporation of hydrocarbon in Valencia oranges, 4.55
Determination of sorbitol in raisins and dietetic foods by GLC, 4.68
Dextrinase activity of extracts of plants, 14.39
Dialkyl aerolein formation in meat during heating,9.48
Dibutyl and Di-(2-ethylhexyl) phthalate in fish,9.77
Dichlorvos residues in food exposed during disinfection of aircraft, 16.19

Distribution and excretion of saccharin in the rat, 12.25
Effect of controlled atmosphere storage on respiratory metabolism of apple tissue, 4.64
Effect of gamma radiation on D-glucose in apple juice, 4.65
Effect of preharvest sprays on storage behaviour of Navel orange, 4.53
Effect of processing pH on the properties of peanut protein isolates and oil, 5.11
Effect of relative humidity, temperature and length of storage on decay and quality of potatoes and onions, 4.83
Effect of water and microwave energy precooking on microbiological quality of chicken parts, 9.64
Effect of nitrogen nutrition and day temperature on composition, colour and nitrates in tomato fruits, 4.75
Fatty acids of Aspergillus ochraccus, 14.40
Fatty acids of peanut, 5.12
Ferulic acid as a water insoluble pentosans of wheat flour, 2.69
Flavour of soybean, flour, isolates and defatted flakes, 5.19
FPC as an emulsifier, 9.79
Functionality of dried yeast protein, 14.38
Gel chromatography of sun flower proteins, 5.23
Glucosinolate and its influence on nutritional value of rape seed meal, 5.22
Glutamic acid in gliadins and caseins, 2.71
Heat inactivation of peroxidase isoenzymes in sweet corn, 2.82
Heat induced changes in beef muscle collagen, 9.58
Hydrated protein fibrils from wheat endosperm, 2.59
Hygroscopic properties of corn starch oligosaccharides, 2.83
Identification of gangliosides as constituents of egg yolk, 9.71
Improved methods for determination of soluble carbohydrates, 13.15
Increasing tenderness of bullock beef by papain injection, 9.51
Influence of bacteria on carbonyl compounds of ground porcine muscle, 9.62
Inversion of weak flour to strong flour, 2.62
Isolation and characterization of gliadin like subunits from glutelin, 2.72
Isolation and identification of pyrazines in cooked beef, 9.56
Isolation and properties of trypsin and chymotrypsin inhibitors from barley grits after storage, 2.86
Lipids of leaf protein concentrate, 4.79
Lipoxidases in pea seeds and seedlings, 3.5
Low dose irradiation for fresh bread system for space flights, 2.76

Low molecular weight carbohydrates from rapeseed meal, 5.21
Lysine fortification of commercial bulgur, 2.78
Metabolism of lindane - ^{14}C in the rabbit, 16.17
Metal co-ordination compounds of thialbendazole, 16.20
Modification of wheat flour proteins with succinic anhydride, 2.67
Nutritional and chemical studies on processed soybean foods, 5.14
Nutritional evaluation of kidney beans, 3.4
Oat protein concentrates, 2.87, 2.88, 2.89
Organic acid and sugar in ripening grapes, 4.67
Polyphenoloxidase in wheat grain, 2.75
Potato proteins coagulated by steam injection heating, 4.82
Precursors of N-nitrosopyrrolidone in bacon and other fried foods, 9.63
Preparation and properties of low temperature extracted animal protein concentrates, 9.47
Identification of gangliosides as constituents of egg yolk, 9.71
Preparation of gliadin proteins, 2.73
Rate of water penetration into wheat proteins, 2.55
Reduction of mercury content in FPC by enzymatic digestion, 9.78
Simulated meats from soy proteins, 5.16
Spaghetti processing and semolina [illegible], 2.77
Stability and acceptability of phosphate treated and precooked chicken pieces reheated with microwave energy, 9.67
Starch-protein interface in wheat endosperm, 2.74
Statistical evaluation of biochemical constituents on colour, brightness and strength of black tea, 11.14
Structure and mineral composition of cereal aleurone cells, 2.61
Substitutes for pigment formation in cured meat products, 9.42
Sulphur compounds of cooked beef, 9.55
Suppression of fungal growth of isolated trypsin inhibitors of corn grain, 2.80
Surface ultrastructure and tensile properties of cathepsin and collagenase treated muscle, 9.49
Volatiles of baked potato, 4.85
Volatiles during roasting of peanuts, 5.10
Volatile retention during freeze drying of aqueous suspensions of cellulose and starch, 7.6
Xanthophyll esterification in grape fruit, 4.57

18. FOOD PROCESSING, PACKAGING & ENGINEERING

18.17 A concept new to food industry: identifying and removing causes of error at a food manufacturing plant-2, B.L.MURRAY & D.V.ALLEN, Fd Technol.Champaign, 1973, 27 (10), 28.

The last 2 steps of a 14 point quality improvement programme have been discussed. They are: management, commitment, choosing quality improvement team, measuring, quality, determination of cost of quality, taking corrective action, defect prevention audit, supervisor training, goal setting, error cause removal, recognition programmes, quality council participation, zero defects planning and zero defects day.

JVS

18.18 Aseptic bag-in-box packaging, L.LANGE, Fd Technol.Champaign, 1973, 27 (10), 80.

Aseptic filler used for filling products into plastic bags inside card board containers has been described.

JVS

18.19 The influence of packaging materials, on microbial growth, H.D.LLYN & J.R.EVERTON, Fd Technol.Aust., 1973, 25 (9), 436.

Review deals with basic properties of some packaging materials, effect of flexible packaging on microbial growth, food stuffs of high water activity, flexible packaging for low water activity products, protection of materials from microbial attack by packaging and loss of preservatives as the result of flexible packaging,

K/R

18.20 Development and use of a laboratory stuffing apparatus, J.E.RAYMOND & R.L.SAFFLE, J.Fd Sci., 1973, 38 (1), 181.

An efficient small batch sausage stuffer has been designed for laboratory use.

Effect of finish frying conditions on quality of french fried potatoes, 4.84
Effect of gamma radiation on D-glucose of apple juice, 4.65
Effect of water and microwave energy precooking on microbiological quality of chicken parts, 9.64
Evaporative cooling of blanched vegetables, 4.65
Low dose irradiation for fresh bread system for space flights, 2.76
Physical aspects of the drying of fish meals, 9.80
Process for producing pumpkin dehydratases, 4.77
Standard fibre board carton and wooden box for banana packaging, 4.61

19. FOOD TEXTURE & FLAVOUR

19.12 Complex sensory assessment, J.M.HARRIES, J.Sci.Fd Agric., 1973, 24 (12), 1571

Some themes common to food science, psychology and statistics, are reviewed in the context of the practical sensory experimentation with difficult foods, or with simple foods in difficult situations. Knowledge of statistics and psychrometrics can help in food scientists in the future development of sensory methods.

AA

19.13 An analytical and integrative approach to sensory evaluation of foods, A.KRAMER, J.Sci.Fd Agric., 1973, 24 (11), 1407.

19.14 Texture improvement of fresh pack dill pickles by addition of lactose and sucrose, P.JELEN & W.M.BRUNE, J.Fd Sci., 1973, 38 (1), 99.

The relation between texture profile analysis (TPA) and sugar concentration was significant. A minimum of 6% sugar is considered necessary for meaningful texture improvement. The presence of lactose was not objectionable at their 0-6% level range.

KAR

19.15 Separation of components of aroma concentrates on the basis of functional group and aroma quality, JAMES K.PALMER, J.agric.Fd Chem., 1973, 21 (5), 923.

Fractionation by functional group class or upto some level by molecular weight within classes became possible when aroma concentrates were subjected to elution from silica gel at 0° with freon or ether in freon. Identification by GLC-MS may be employed then to concentrate aroma bearing fractions with few components of the same functional class. Separation of an aroma concentrate may be achieved by using analytical or preparative scale elution conditions. Data on aroma components of banana, coffee and cheese by employing these techniques are presented and discussed.

BSN

19.16 Interaction of 5'-nucleotides with gelatin - a model system for flavour potentiation, P.SAINT-HILAIRE & J.SOLMS, J.agric.Fd Chem., 1973, 21 (6), 1126.

The association constants K (mM-1) obtained with the equilibrium method in the system gelatin -5'-nucleotide-water (pH 6.5, 20°) are as follows: 5'-GMP 235, 5'-IMP 112, 5'-AMP 29 and 5'-CMP very small. They correspond in sequence and in relative magnitude exactly to the relative taste potentiating activities of these compounds as reported by Ymaguchi et al. (1971).

19.17 Formation of pyrazines from thermal treatment of some amino-hydroxy compounds, PAO-SHNI WANG & GEORGE V.ODELL, J.agric.Fd Chem., 1973, 21 (5), 868.

Pyrazines, one of the important precursors of food flavours, were obtained by heating aminohydroxyl compounds like ethanolamine, glucosamine, serine, threonine, 4-amino-3-hydroxy butyric acid and alanyl serine. The participation of sugars in pyrazine formation although was found favourable was not found to be necessary.

BSN

19.18 High resolution infra red spectra of fragrance and flavour compounds, W.W.MORRIS, J.Ass.off. anal.Chem., 1973, 56 (5), 1037.

The fragrance compounds were isolated from commercial and natural sources, purified by preparative GLC and their structure verified by NMR. A library of standard IR spectra has been compiled for 94 fragrance and flavour compounds.

JVS

See also

Aroma and flavour of mango of fatty acid composition, 4.59
Aroma components of alcoholic distillates, 14.47
Aroma of olive oil, 6.20
Beef aging and tenderness as influenced by glycolysis and dephorylation, 9.59
Classification of corn odour by statistical analysis of GC patterns, 2.81
Effect of freeze-thaw cycles on tenderness and cooking loss in beef, 9.57
Effect of some citrus juice constituents on taste thre holds for limonin and naringin for bitterness, 4.52
Flavour compounds of freeze dried coffee, 11.13
Flavour of raw soybeans, flour, defatted flakes and isolates, 5.19
GC studies of volatiles from foods, 13.12
Gel consistency test for eating quality of rice, 2.51
GLC determination of beta asarone of oil of calamus in flavours and beverages, 12.26
Increasing tenderness of bullock beef by papain injection, 9.51
Injection of papain and its effect on lamb muscle toughness induced by rapid chilling, 9.46
Isolation and identification of pyrazines in cooked beef, 9.56
Pentrometer readings for assessing cooked raw beef tenderness, 9.54
Preparation of beef flavour precursors, 9.60
Sensory evaluation of high moisture dry prunes preserved with sodium benzoate, 4.70
Stability and acceptability of phosphate treated and precooked chicken pieces rehcated with microwave energy, 9.67
Textural changes in precooked lobster meat during radurization followed by refrigerated storage, 9.82
Volatiles during roasting of peanuts, 5.10
Volatiles of baked potatoes, 4.85